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# COMMERCIAL FISHERIES REVIEW



A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

DEPOSITED BY THE  
UNITED STATES OF AMERICA

Joseph Pileggi, Editor  
G. A. Albano and H. Beasley, Assistant Editors

Address correspondence and requests to the: Chief, Fishery Market News Service, U. S. Bureau of Commercial Fisheries, 1815 North Fort Myer Drive, Room 510, Arlington, Va. 22209.

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## RAPID SPREAD OF BARNACLE INVESTIGATED

Investigation is being carried out on the world's rapid spread of the barnacle (*Eliminius modestus*), also known as the Australian barnacle, which first turned up in European quarters in 1945 at Chichester, and by 1953 had reached the German coast, spreading rapidly to the estuarine system of the River Elbe and the Schleswig-Holstein coast. It reached the islands of Helgoland and Sylt by 1955. This presumably passive passenger is now common in many European coastal areas and competes with the native barnacle (*Balanus*), the acorn barnacle, but it is known to be less tolerant of low water temperatures which have held production to a less rapid rate than might have been possible. (See *Secrets*, April 1964.)



Editorial Assistants: Ruth V. Keefe and Jean Zalevsky

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\* \* \* \* \*

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## IMPROVED RAPID METHOD FOR DETERMINING TOTAL LIPIDS IN FISH MEAL

By Preston Smith, Jr.\*, Mary E. Ambrose\*, and George N. Knobl, Jr.\*\*

### ABSTRACT

In a search for a quicker method for the determination of total lipids in fish meal than the currently used method of the Association of Official Agricultural Chemists, the rapid Bligh and Dyer method for determining the lipid in fish meat was studied. Problems involving filtration and emulsions were encountered, which were largely eliminated, respectively, by using diatomaceous earth and anhydrous sodium sulfate and by increasing the initial ratio of solvent to water in the extraction process. Thus modified, the Bligh and Dyer method gave results in close agreement with those obtained by the more time-consuming AOAC method.

### INTRODUCTION

Fish meal is one of several ingredients usually contained in commercial mixed feeds for animals. The manufacturers of those feeds are careful to ensure that the nutritive value of their products remains uniform and consistently high in quality. Hence fish meal and the other ingredients used in the formulations are carefully checked. Ordinarily, fish meal is analyzed for such components as moisture, nitrogen, and lipid content. The nitrogen content is indicative of the amount of protein present, and the lipid content provides an index of the caloric value of the meal.

Unlike the closely specified procedure used for ascertaining the content of nitrogen, the content of lipid may be determined by any of several methods. The method that has been used quite satisfactorily as an index for caloric value is that of ether extraction (crude fat). Recently, however, there has been a growing demand for information on the fats or lipids in fish meals that cannot be extracted by ether ("total" fat)<sup>1</sup>, since there is speculation that the difference between total fat and crude fat may indicate the degree of oxidation of the fat.

The method of the Association of Official Agricultural Chemists for determining total lipids in fish meal provides consistent



Determination of lipids in fish meal by the modified Bligh and Dyer method.

\*Chemist

\*\*Supervisory Chemist

Technological Laboratory, U. S. Bureau of Commercial Fisheries, College Park, Md.

<sup>1</sup>/"Total" fat, for purposes of this paper, will be the value obtained by the method (22.037) of the Association of Official Agricultural Chemists (1960).

ly reproducible results and gives values among the highest obtained by any method. In the AOAC method, the initial extraction of fish meal is followed by acid hydrolysis and then by a second acetone extraction. These conditions presumably free the "bound" lipids and extract "total" lipids from the fish meal. Because this method requires over 35 hours to complete, it is not a rapid analytical tool.

In 1959, Bligh and Dyer developed a rapid extraction procedure to measure the lipids in raw fish. Briefly, their method consists of homogenizing the fish tissue with a mixture of chloroform and methanol in such proportions that a miscible system is formed with the water in the tissues. Subsequent dilution with chloroform and water then separates the homogenate into two phases. After filtration and clarification, the chloroform layer contains the lipids, and the methanol-water layer contains the nonlipid material. Unfortunately, though this method is rapid, it is not entirely satisfactory for use with fish meal.

The purpose of the work reported in this paper therefore was to try to modify the rapid Bligh and Dyer method so that it can be used to determine reproducibly and accurately the total lipids in fish meals. The main topics considered in this report are the following:

1. Modifications needed in the Bligh and Dyer method.
2. Description of the modified method developed.
3. Evaluation of the modified method.

#### MODIFICATIONS NEEDED

In our study of the modifications needed to adapt the Bligh and Dyer method for use with such materials as fish meal, five menhaden meals were used. (Menhaden meal constitutes the bulk of the fish meal produced in the United States.) These meal samples differed in age and were from various areas of production. The principal difficulties encountered in the use of the Bligh and Dyer method in the analysis of these meals arose from problems relating to filtration and emulsions.

FILTRATION: When the unaltered method was used with the fish meals, two of the samples would not filter satisfactorily. Hyflo Super Cel (diatomaceous earth), however, has been used in column chromatography (Hanahan, Dittmer, and Warashina 1957) to enhance the flow of lipids through columns. This product and anhydrous sodium sulfate were therefore used in an attempt to improve filtration. By this procedure, all five samples filtered faster and gave a clearer filtrate than was obtained with the unmodified Bligh and Dyer method.

EMULSIONS: Emulsions were formed in all five samples tested. The following procedures were tried in an attempt to lessen the formation of emulsions: (1) addition of neutral salts--sodium chloride, potassium chloride, and magnesium chloride; (2) use of higher alcohols for extraction--methanol was replaced by ethanol and octanol; (3) use of a surfactant--Aerosol OT; (4) centrifugation; and (5) changes in the ratio of the organic solvents.

The sample that gave the largest amount of emulsion with the unmodified Bligh and Dyer method was used to evaluate these procedures. Changes in the ratio of the organic solvents proved to be the most beneficial of the alterations tried, so this modification was studied in detail. The phase-volume ratio was changed from an initial ratio of 50 ml. of chloroform: 100 ml. of methanol, to 100 ml. of chloroform : 100 ml. of methanol, and finally to 150 ml. of chloroform : 100 ml. of methanol. Higher values for extractable material were obtained with both modifications in ratio of solvents. The last ratio of solvents, however, also resulted in both decreased emulsions and in improved filtration and was therefore considered the more satisfactory.<sup>2/</sup> Table 1 presents the results of extraction of lipid by the unmodified Bligh and Dyer method and by the various modifications in the ratio of solvents.

<sup>2/</sup>In addition, this ratio of solvents resulted in a biphasic system throughout the extraction procedure. Hence, some people may interpret this approach as a new application of chloroform:methanol extraction rather than a modification of the Bligh and Dyer method.

Table 1 - Fat Extracted from Samples of Fish Meal by Variations of the Bligh and Dyer Method

Extraction Method	Replicate	Fat Content of Fish-Meal Sample:				
		E	6C79	4B120	12C13	G
1. Original method 50 CHCl <sub>3</sub> /100 MeOH	1	11.87	9.44	1/	11.81	1/
	2	12.1	9.38	-	11.93	-
2. Filtering aid 50 CHCl <sub>3</sub> /100 MeOH	1	11.86	9.19	13.19	11.52	10.23
	2	11.68	9.10	13.44	11.65	10.90
3. Filtering aid 100 CHCl <sub>3</sub> /100 MeOH	1	12.82	9.90	14.76	12.59	10.36
	2	13.42	9.64	14.78	12.23	10.31
4. Filtering aid 150 CHCl <sub>3</sub> /100 MeOH		12.80	10.22	14.51	12.51	10.41

1/The samples were not filterable.  
Note: Each entry represents a single analysis except Method 4 where each entry is the average of six analyses. Column headings "E," "6C79," etc. identify number of sample.

## MODIFIED METHOD

The modified method resulting from the observations reported in the previous section is as follows:

1. Homogenize 10 grams of fish meal in an electric blender for 2 minutes with a mixture of 37 ml. of water, 150 ml. of chloroform (analytical reagent grade), and 100 ml. of absolute methanol (analytical reagent grade).
2. Add 50 ml. of chloroform to the mixture, and blend for an additional 30 seconds.
3. Transfer the mixture to a 600-ml. beaker containing 20 grams of Hyflo Super Cel and 20 grams of anhydrous sodium sulfate.
4. Mix the contents; and filter into a 1,000-ml. filter flask, using a Buchner funnel and Whatman number 1 filter paper.
5. Add 50 ml. of water to the filtrate, and mix thoroughly.
6. Transfer the filtrate to a 500-ml. graduated cylinder.
7. Reblend the residue for 2 minutes with 200 ml. of chloroform, and then refilter.
8. Add the filtrate to the cylinder.
9. Wash the blender jar, beaker, and filtering flask with about 50 ml. of chloroform.
10. Filter the washings and add them to the cylinder.
11. Allow a few minutes for separation and clarification of the filtrate, record the volume of the chloroform, and remove most of the methanol-water layer by aspiration.
12. Mix the contents of the cylinder, and remove the remaining methanol-water layer and also a small volume of the chloroform layer.
13. Take a 25-ml. aliquot of the chloroform layer, and dry it under a stream of nitrogen in a 50° C. water bath.
14. Place the dried sample in a vacuum dessicator over phosphorus pentoxide, and allow to dry overnight.
15. Calculate the weight of the total lipid in the sample as follows:

$$\text{Wt. of total lipid} = \frac{\text{Wt. lipid in aliquot} \times \text{volume of chloroform layer}}{\text{Volume of aliquot}}$$

## EVALUATION

In evaluating the modified Bligh and Dyer method, we were concerned with the following four aspects:

1. Purity of the lipid extract obtained by the modified method.
2. Precision of the method.
3. Accuracy of the method.
4. Comparison of the results obtained by the method with those obtained by the AOAC method.

**PURITY:** The material extracted by organic solvents usually contains some nonlipids. In a satisfactory method for determining lipid, this extract of nonlipid material must, of course, be kept to a minimum. Accordingly, we tested the purity of the extracted material by drying an aliquot of the extracted fat, redissolving it in chloroform, and observing it for undissolved residue. With the improved initial ratio of 150 ml. of chloroform : 100 ml. methanol for extraction, no residue was noted in any of the samples tested. However, in some of the other procedures tested, residue was observed.

**PRECISION:** To determine the reproducibility of results of the improved procedure, we analyzed each of five menhaden meals six times, and evaluated the results statistically. As is shown in table 2, the maximum deviation from the mean was  $\pm 0.23$  percent.

Table 2 - Reproducibility of Improved Method of Extraction of Fat

Sample	Mean	Standard Deviation	Standard Error
E . . . . .	12.80	0.14	0.06
G . . . . .	10.41	0.11	0.04
6C79 . . . . .	10.22	0.23	0.10
4B120 . . . . .	14.51	0.20	0.08
12C13 . . . . .	12.51	0.21	0.09

Note: The mean represents the average of six analyses.

**ACCURACY:** Test results on samples to which oil has been added should give an indication of the accuracy of the method in terms of the possible errors in the mechanical manipulations, although not in terms of the ability of the system to extract bound fat.

Table 3 - Recovery of Menhaden Oil Added to Fish Meal

Sample	Fat Present			Fat by Analyses	Recovery
	In Sample	In Oil	Total		
E	12.71	3.00	15.71	16.05	102.2
		3.04	15.75		
G	10.56	3.22	13.78	13.93	101.1
		3.16	13.72		
6C79	10.48	3.04	13.52	13.66	101.0
		3.01	13.49		
4B120	14.67	3.08	17.75	17.41	98.1
		3.23	17.90		
12C13	12.72	3.03	15.75	15.51	98.5
		3.20	15.92		

Recoveries were tested by extracting mixtures of 0.3 grams of menhaden oil with 10 grams each of the same five menhaden meals. Table 3 presents the recovery data, showing that the widest variation in the recovery of menhaden oil was 2.2 percent.

**COMPARISON:** The AOAC method 22.037 for the determination of fat in fish meal was used for comparison. The data in table 4 show that closely comparable results were obtained by the AOAC method and the modified Bligh and Dyer method. It is interesting to note that the values obtained with the modified method were lower for four meals, but that for one meal,

more lipids were found than by the AOAC method. In no pair of values, however, was the absolute difference greater than 0.48 percent.

### SUMMARY AND CONCLUSION

In trying to shorten the time of analysis required by the AOAC method for total lipid in fish meal and similar products, we studied the possibility of adapting the Bligh and Dyer method used for analyzing the lipid in fish meat. We used five samples of menhaden meal of varying age and lipid content in developing and testing the modified method.

Applying to fish meal the Bligh and Dyer method--which utilizes chloroform, methanol, and water in such proportions that after the initial extraction, a two-phase system is formed--results in problems involving filtration and emulsions. Filtration was improved by the addition of diatomaceous earth and anhydrous sodium sulfate. Emulsions were largely eliminated by increasing the initial ratio of solvent to water.

The purity of the extract was tested by drying an aliquot of the extracted fat, redissolving it in chloroform, and checking for insoluble material. After the ratio of solvent to water was changed, no residue was noted in any of the five samples tested. The precision of the method was checked by analyzing six replicates of each of the five menhaden meals and evaluating the results statistically. The maximum deviation from the mean was  $\pm 0.23$  percent. The accuracy of the improved method was determined by the percent recovery of added menhaden oil to the same five fish meal samples. The widest variation noted in recovery was 2.2 percent. Lipid determination by the improved method compared favorably with results from AOAC method 22.037.

We concluded that in the analysis of menhaden meal and presumably of other fish meals the modified rapid Bligh and Dyer method could serve satisfactorily as a substitute for the more time-consuming AOAC method.

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Created in 1849, the Department of the Interior--a department of conservation--is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States--now and in the future.

# TRENDS AND DEVELOPMENTS

## Alaska

### TRENDS AND DEVELOPMENTS, APRIL 1964:

Developments in the Alaska fisheries following the March 27 earthquake, foreign fishing activity, and other developments for April as reported by the U. S. Bureau of Commercial Fisheries Alaska Regional Office, Juneau:

Commercial Fishing Industry Still Operational in Spite of Earthquake: The March 27, 1964, earthquake in Alaska caused widespread rising or subsidence of large sections of land masses in Alaska. The epicenter was apparently in the Prince William Sound area. As of the end of April, information indicated that the fault line extended from east of Kodiak northerly through the Kenai Peninsula. West of that fault line the land masses subsided 5 or 6 feet, and east of the fault line the land was raised 5 or 6 feet. Along with this tremendous earth movement were tidal waves which inundated large parts of the lowlands surrounding the Gulf of Alaska. Southeastern Alaska, east of Yakutat, was virtually unaffected. The Alaska Peninsula, Aleutian Islands, Bristol Bay, and Arctic coastline also suffered little damage. The prin-



Fig. 1 - This is what the harbor at Kodiak looked like after the earthquake. Pieces of the dock are floating here as well as resting inland. Tides now running 8 feet higher than old maximums.

cipal damage occurred in the Cook Inlet, Kodiak Island, and Prince William Sound areas.

Although the impact of the quake and waves destroyed many boats, skiffs, gear, and some shore plants, the overall impact on the fishing industry was not as severe as at first indicated. The suffering and hardship to individuals cannot be minimized, but the fishing industry as a whole was still functional a month after the catastrophe.

The king crab fishery was the hardest hit with about 15 to 20 percent of its 1963 capability destroyed. The shrimp fishery suffered relatively minor damages, although the largest shrimp plant at Seward was lost. While many salmon vessels and two salmon plants were destroyed, the salmon industry retains the capability for harvesting the 1964 run in the normal fashion. Halibut cold-storage plants lost or damaged will cause a redistribution of this season's halibut landings but, otherwise, the halibut industry remains fully capable. The Dungeness crab fishery suffered considerably in the Cordova area with the loss of hundreds of pots and some plant and boat damage. By the end of April it was back in operation almost at full scale. Razor clam beaches off Copper River flats were raised and shifted and some clam mortality occurred, but that industry was going ahead with good results. About 50 to 75 percent of the Copper River flats salmon gill-net fishing area was high and dry in April and state regulations in that area will be changed.

The effects of the quake and waves and the changes in elevation may have severe effects on the fish themselves. At least 30 miles of red snapper were observed floating dead on the surface. The effects of waves, silting, and of millions of gallons of gas and oil dispersed into intertidal zones have caused unevaluated damage. Slides and the falling and shifting of ice undoubtedly had some impact on the resource.



Fig. 2 - Viewing upper downtown section of Kodiak from a hillside. About 24 dwellings were demolished, and many others were moved as much as 4 blocks off their foundations. A good part of the business district sustained substantial damage.



Fig. 3 - Part of the downtown section of Kodiak after the earthquake. Note how vessels were tossed onto the land.

Damage to docks and waterfront facilities, because of the change in elevation, may well exceed the actual damage of the quake and waves. The east side of Kodiak Island has subsided 5 to 6 feet and several major docks and plants probably must be relocated. Homer Spit and Seldovia also appear to be 3 or 4 feet lower and will require extensive dock and plant relocation. The land mass around the Cordova area raised in some places as much as 6 feet and docks, boat ways, and dolphins will require extension or relocation. The entire city of Valdez will be relocated.

Soviet Fishing Fleet off Yakutat: The Soviet trawling fleet operating off Yakutat during April 1964 extended from Cape St. Elias to the Fairweather grounds northwest of Cape Spencer. That fleet included about 95 trawlers, 16 reefers, 3 factoryships, 2 cargo ships, 1 salvage tug, and 1 tanker. The

Soviet catches appeared to be almost entirely Pacific ocean perch, with no salmon, halibut, or appreciable quantities of other incidental species evident. The Soviet trawlers were fishing in depths of 100 to 165 fathoms, averaging about one hour per drag, and with catches varying between 1,000 and 20,000 pounds. That fleet off Yakutat constituted the most easterly concerted Soviet fishery so far.

Soviet Crab Fleet Off Kodiak: The Soviet crab factoryship Pavel Chebotnyagin and her tangle net-setting SRT's were observed fishing king crab in the Gulf of Alaska on April 6, about 15 miles north of Chirikof Island south of Kodiak Island. Surface and aerial observations of that vessel's operation were analyzed and it was tentatively estimated the catch by that fleet might exceed 30,000 crabs a day. On April 20, aerial patrol units observed the Chebotnyagin under way about 40 miles south of Chirikof Island, indicating the Soviets had withdrawn from the Kodiak area. On April 22, she left the Gulf of Alaska and entered the Bering Sea via Unimak Pass. As of the end of April, she was operating off Unimak Island.

Soviets Continue to Fish Portlock Bank: The Soviet trawling fleet centered in the Portlock Bank region east of Kodiak has remained at a relatively constant level and is estimated to include 8 trawlers and 2 reefers. There is considerable interchange between that fleet and the larger trawling fleet off Yakutat, both of which are fishing mainly for Pacific ocean perch.

Soviet "Flounder" Activities in Bering Sea: Trawling activities in the eastern Bering Sea by Soviet vessels were at their lowest level this year in April as the flounder expeditions were apparently being terminated and/or diverted to other fisheries. The flounder fleet consisted of about 25 trawlers, 5 reefers, 1 factoryship, and various support vessels.

Soviet Vessels Fish for Shrimp in Bering Sea: The Soviets were engaged in a shrimp fishery northwest of the Pribilof Island, it was confirmed in April. Personnel of Japanese shrimp fishing fleets in the area reported that two Soviet trawlers had been active in that fishery for nearly three weeks. One of the Soviet vessels was observed making one haul yielding an estimated 800 pounds of shrimp.

Japanese King Crab Fleet in Outer Bristol Bay: A Japanese king crab fleet consisting

of the factoryships Tokei Maru and Tainichi Maru, each accompanied by six catcher boats, was reported fishing tangle net gear, centered in outer Bristol Bay north of Port Moller during April.

Japanese Shrimp Fishery: The Japanese shrimp factoryship Chichibu Maru and her accompanying fleet of 12 trawlers left the area northwest of Unimak Pass during April and moved into the more common Japanese shrimp grounds north of the Pribilof Islands. The shrimp factoryship Einin Maru and her reported 12 trawlers were operating in the vicinity of the Chichibu Maru fleet at the time.

Japanese Long-Line Fishery: It was believed the Japanese long-line fleets that entered the Bering Sea halibut fishery in the 3B North Triangle area abandoned the halibut grounds near Unimak Pass and moved north nearer the Pribilof Islands. The Fuji Maru No. 3, with 5 accompanying long-line fishing vessels, was sighted southeast of St. George Island in April.

Japanese "Exploratory" Fishing in Gulf of Alaska: The Japanese stern trawler Taiyo Maru No. 81 was reported operating about 40 miles south of the southwest end of Kodiak Island during April. The second Japanese trawler to conduct "exploratory" fishing in the Gulf of Alaska, the 545-gross-ton side trawler Tenryu Maru, was scheduled to leave Japan on April 15 but had not yet been sighted in the Gulf.

Seismic Exploration Agreement Completed: Negotiations were completed providing safeguards for living marine resources during seismic explorations utilizing explosives in the waters off Alaska. The Bureau of Commercial Fisheries and the Alaska Department of Fish and Game developed provisions governing explosive detonations to minimize the possibilities of damage to marine life and commercial fisheries. Those provisions are incorporated into seismic permits issued by the Alaska Department of Fish and Game for exploration in State of Alaska waters and by arrangement with the U. S. Bureau of Geological Survey are integrated into their permits for seismic exploration in the international waters of the outer continental shelf. Fisheries observers will accompany all seismic teams subject to the provisions to ensure compliance. Those observers are empowered to halt operations any time excessive kills of marine life occur or are likely to occur.

A cooperative agreement between the Bureau of Commercial Fisheries and Alaska Department of Fish and Game provides that the observers will function with equal authority whether in State or International waters.

First Halibut of Season Landed at Ketchikan: Several fares of halibut from the Bering Sea were sold through the Ketchikan Fish Exchange during April. The first trip was delivered to Ketchikan this season by the vessel Yakutat on April 15. Bidding by the local buyers brought a standard price of 18.10, 18, and 10 cents for large, medium, and chicken halibut, respectively.

Herring Roe-on-Kelp Harvest: The herring roe-on-kelp fishery at the west coast villages of Craig and Hydaburg ended in April. At Craig the quota of 110 tons set by the Alaska Department of Fish and Game was reached in 10 hours of fishing, and at Hydaburg the quota of 50 tons was reached in 6 hours. This year 7 packers participated in the fishery as against 2 packers in 1963. Quota requests from processors to the Alaska Department of Fish and Game totaled more than 600 tons in 1964. Prices paid to pickers jumped from 5 to 6 cents a pound in 1963 to 15-20 cents a pound in 1964.

Bureau of Commercial Fisheries Loan Program Takes Emergency Actions: Under Secretary of the Interior James K. Carr met with the Regional Director for Alaska, Bureau of Commercial Fisheries, during his inspection trip to the areas affected by the earthquake disaster. Possible emergency actions that might be initiated and modifications of the Bureau's Fisheries Loan Program that could be affected to aid in recovery operations were discussed. With subsequent authority from the Secretary of the Interior, the Bureau opened an emergency office at Kodiak on April 10, under the supervision of the Chief of the Bureau's Branch of Loans and Grants.

The first emergency loan case was received on April 11 and approved on April 13 along with two other cases that were fully processed over that weekend. With additional personnel, offices were also manned at Anchorage, Seward, Cordova, and Valdez, for several days at each location. Personnel in that Branch's Seattle office also handled emergency loan cases to assist those who went south seeking replacement vessels, or repairs to damaged vessels.

In April 34 applications for loans (totaling over \$500,000) were handled in Alaska; 9 additional applications were being processed through the Seattle office. Throughout the month of May the affected areas were to be revisited and processing of loans was to continue as rapidly as possible. As many who lost vessels had not yet made firm plans to obtain replacement vessels, it was expected that applications would continue to be received sporadically for several more months.

Exploratory Fishing Plans Completed: Arrangements were made by the Bureau of Commercial Fisheries Branch of Exploratory Fishing to charter the halibut schooner Paragon starting May 18 at Seattle. Unless earthquake repercussions or other circumstances make it unfavorable, exploratory fishing personnel planned to conduct about 3 weeks of underwater television experiments from Port Wakefield. Those studies, starting on or about May 26, were planned to determine the feasibility concerning the use of television for locating and studying king crab. Follow-

At the hearing, sportsmen argued that commercial fishermen had already ruined the sardine industry and that the same thing would happen to the anchovies if the permits were granted. They said that the anchovy is the key to sport fishing in southern California and that without the anchovy as a forage fish, the bigger species such as yellowtail, baracuda, tuna, and albacore would have to migrate to more favorable waters toward Mexico.

The California Fish and Game Commission voted 5-0 against the commercial fishermen's request.

Note: See Commercial Fisheries Review, June 1964 p. 12.



### Cans--Shipments for Fishery Products

January-December 1963: The amount of steel and aluminum consumed to make cans shipped to fish and shellfish canning plants during 1963 was down 6.9 percent from that

Table 1 - U. S. Domestic Shipments of Metal Cans for Fishery Products, 1963 and 1962  
(Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	First Quarter		Second Quarter		Third Quarter		Fourth Quarter		Year	
	1963	1962	1963	1962	1963	1962	1963	1962	1963	1962
East <sup>1/</sup>	155,814	158,531	215,924	189,556	276,572	341,193	173,532	191,087	821,842	880,367
Southern	21,010	13,403	38,197	32,668	34,986	21,765	33,673	30,269	127,866	98,105
North Central	29	63	5	29	8	22	29	26	71	140
West <sup>2/</sup>	381,735	414,199	629,376	701,831	594,561	562,140	315,983	425,942	1,921,655	2,104,112
Total all areas	558,588	586,196	883,502	924,084	906,127	925,120	523,217	647,324	2,871,434	3,082,724

<sup>1/</sup>Includes Puerto Rico.

<sup>2/</sup>Includes Alaska and Hawaii.

ing in the experimental studies on king crab, it is planned that detailed shrimp exploration will continue off Kodiak Island and westward along the Alaska Peninsula.

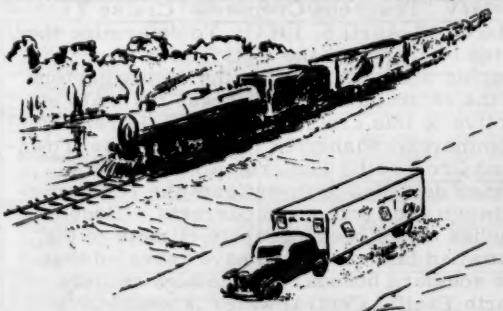


### California

#### REQUEST FOR ANCHOVY INDUSTRIAL FISHERY DENIED:

A request by commercial fishermen of Monterey, Calif., to take 13,000 tons of anchovies for reduction into meal and oil was denied by the California State Fish and Game Commission. This was the result of a special meeting held on May 11, 1964, at Monterey so that public comments could be heard on the proposed experiment to fish for anchovies for reduction purposes, and whether or not permits should be granted to firms in the Monterey area for that purpose.

used during 1962. The decline was due to smaller shipments to the Eastern and Western Areas which were only partly offset by larger shipments to the Southern Area. The pack of salmon and tuna was down on the West Coast. A smaller pack of Maine sardines accounted for the decline in shipments to the East Coast. On the Gulf Coast, however, there was a considerable increase in the pack of shrimp.



**January-March 1964:** Shipments of cans for fishery products during January-March 1964 were 2.6 percent below shipments in the first quarter of 1963. A decline in shipments to the Western Area (due to a drop in the pack of tuna) was almost offset by larger shipments to the Eastern Area. East Coast canneries now packing tuna account for most of the increase in the Eastern Area.

Table 2 - U. S. Domestic Shipments of Metal Cans for Fishery Products, Jan.-March 1963 and 1964 (Base Boxes of Metal Consumed in the Manufacture of Cans for Fishery Products)

Receiving Area	Jan.-March 1964	1963
East <sup>1/</sup> . . . . .	187,707	155,814
Southern. . . . .	24,761	21,010
North Central . . . . .	492	29
West <sup>2/</sup> . . . . .	359,947	381,735
Total all areas. . . . .	572,907	558,588

<sup>1/</sup>Includes Puerto Rico.  
<sup>2/</sup>Includes Alaska and Hawaii.

In January-March 1964, shipments to the Pacific or Western Area accounted for 62.8 percent of total shipments; shipments to the Eastern Area accounted for 32.8 percent; and shipments to the Southern Area accounted for most of the remaining 4.4 percent. Most of the fish-canning facilities are located in the Pacific Area.

Notes: (1) Statistics cover all commercial and captive plants known to be producing metal cans. A "base box" is an area 31,360 square inches, equivalent to 112 sheets 14" x 20" size. Tonnage figures for steel (tinplate) cans in 1964 are derived by use of the factor 23.5 base boxes per short ton of steel. (In the years 1962 and 1963, tonnage data were based on the factor 21.8 base boxes per short ton of steel.) The use of aluminum cans for packing fishery products is small.

(2) See *Commercial Fisheries Review*, Jan. 1964 p. 9, April 1963 p. 15.

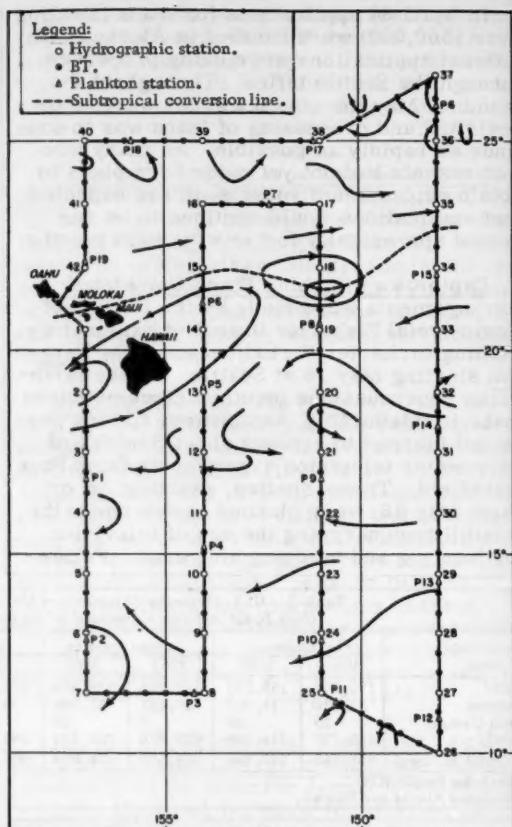


## Central Pacific Fisheries Investigations

### TRADE WIND ZONE

#### OCEANOGRAPHIC STUDIES CONTINUED:

**M/V "Townsend Cromwell" Cruise 2** (March 16-April 5, 1964): To determine the rates of change in the distribution of oceanographic properties within the trade wind zone of the central North Pacific was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Townsend Cromwell. The cruise was one of a series designed to investigate the relation between wind and ocean currents. (Recent studies of the oceanographic climate of the Hawaiian Islands region have revealed that the southern boundary of the high salinity North Pacific Central water is seasonally



Cruise track of M/V Townsend Cromwell Cruise 2 (March 16-April 5, 1964), and flow patterns based on geostrophic interpretation of the distribution of the depth of the 20°C. isotherm.

displaced north-southward. Those surface water displacements are believed to be associated with seasonal changes in the trade wind system. In addition, the trade wind area is one of the most important energy transfer regions in the North Pacific and events there affect the whole North Pacific Central and North Pacific Equatorial circulation systems.)

During the cruise, 42 oceanographic stations were occupied. At each station temperatures and samples for salinity analysis were obtained at 20 depth points extending to 1,500 meters.

Bathythermograms were obtained at 30-mile intervals along the cruise track, and between selected stations (19-21, 26-28, and 35-37) bathythermograph casts were made at 10-mile intervals.

Surface temperatures and water samples for salinity analysis were obtained at each bathythermograph observation.

Bathythermograph data were coded and transmitted four times daily to the Fleet Numerical Weather Facility, Monterey, Calif.

At station 25, while drifting relative to a parachute drogue, subsurface currents were measured by means of a meter at depths of 10, 25, 50, 75, and 100 meters.

Sets of 10 plastic-enclosed drift cards were released at 30-mile intervals along the entire cruise track.

Standard marine weather observations were made and transmitted 4 times daily.

Radiation from sun and sky was measured and recorded daily by a pyrheliometer. Colored photographs of cloud formations were made.

Surface plankton tows of 30 minutes were made daily with a 1-meter net.

A standard watch for bird flocks and fish schools was maintained by vessel personnel during daylight hours. In addition, observers from the Smithsonian Institution maintained a watch for birds.

The chart shows, in addition to the cruise track, the ocean current pattern within the survey region as inferred from field plots of the distribution of the depths of the  $20^{\circ}$  C. ( $68^{\circ}$  F.) isotherm. In general, the current pattern was similar to that previously obtained by the same method during Townsend Cromwell Cruise 1 (February 14–March 6, 1964). However, the large counterclockwise eddy found at approximately  $13^{\circ}$ – $14^{\circ}$  N. latitude between  $150^{\circ}$ – $155^{\circ}$  W. longitude on Cruise 1 was not seen on the Cruise 2 distribution. But two other flow patterns, not present during Cruise 1, were noted on the  $20^{\circ}$  C. isotherm chart for Cruise 2. Those flow patterns were: (1) a counterclockwise eddy at  $18^{\circ}$ – $19^{\circ}$  N. latitude between  $148^{\circ}$ – $153^{\circ}$  W. longitude, and (2) a clockwise eddy between stations 6 and 7. At the time of Cruise 2, the subtropical convergence east of the Hawaiian Islands was located at about the same position as during Cruise 1.

A total of 14 unidentified fish schools and 1 skipjack school were sighted during Cruise

2. Eleven of those schools, including the skipjack school were sighted south of  $15^{\circ}$  N. latitude. The remaining 4 schools were sighted in the vicinity of the Hawaiian Island chain.

Note: See Commercial Fisheries Review, May 1964 p. 13, Oct. 1963 p. 30.



## Federal Purchases of Fishery Products

**DEPARTMENT OF DEFENSE PURCHASES,  
JANUARY-APRIL 1964:**

JANUARY - APRIL 1964:  
Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, less fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in April 1964 than in the previous month. The decline was 27.2 percent in quantity and 26.9 percent in value. Compared with the same month in the previous year, purchases in April 1964 were down 12.6 percent in quantity and 6.4 percent in value.

Total purchases in the first 4 months of 1964 were up 5.2 percent in quantity, but down 6.3 percent in value because of generally lower

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, April 1964 with Comparisons

QUANTITY				VALUE			
April		Jan.-Apr.		April		Jan.-Apr.	
1964	1963	1964	1963	1964	1963	1964	1963
<b>• 1,734</b>   <b>1,198</b>   <b>1,8,524</b>   <b>1,8,102</b>				<b>• (1,000 Lbs.)</b>   <b>• (1,000)</b>   <b>1,965</b>   <b>1,4,458</b>			
• 1,734	1,198	1,8,524	1,8,102	• (1,000 Lbs.)	• (1,000)	1,965	1,4,458

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products  
by Defense Subsistence Supply Centers, April 1964  
with Comparisons

Product	April		Jan. - April		
	1964	1963	1964	1963	
<b>Shrimp:</b>	(Pounds) . . . . .				
Raw headless	132,600	1/	414,650	1/	
Peeled and deveined	44,986	1/	276,208	1/	
Breaded	359,900	1/	1,454,100	1/	
Total shrimp	537,486	432,371	2,144,958	2,059,004	
<b>Scallops</b>	219,350	205,000	910,350	775,968	
<b>Oysters:</b>					
Eastern	24,502	1/	351,420	1/	
Pacific	19,314	1/	93,120	1/	
Total oysters	43,816	82,345	444,540	431,867	
<b>Clams</b>	16,500	19,470	136,858	99,170	
<b>Fillets:</b>					
Cod	45,520	62,455	172,766	238,053	
Flounder and sole	141,000	279,680	1,314,816	1,267,532	
Haddock	99,530	164,850	2/677,424	849,070	
Ocean perch	236,100	364,030	1,247,220	1,334,620	
<b>Steaks:</b>					
Halibut	116,770	98,170	423,795	500,598	
Salmon	15,675	18,390	64,977	69,925	
Swordfish	700	2,050	6,010	11,230	

**SWORDFISH**

<sup>2</sup>/Includes 8,650 pounds of haddock portions.

prices. In January-April 1964 there were larger purchases of shrimp, scallops, clams, and flounder fillets, but smaller purchases of cod fillets, haddock fillets, ocean perch fillets, and halibut steaks.

Canned: In the first 4 months of 1964, total purchases of the 3 principal canned fishery products (tuna, salmon, and sardines) were up 88.2 percent in quantity and 87.1 per-

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, April 1964 with Comparisons									
Product	QUANTITY				VALUE				
	April 1964	1963	Jan.-April 1964	1963	April 1964	1963	1964	1963	
Tuna	2	(1,000 Lbs.)	302	1,459	998	1	148	645	506
Salmon	-		679	6	-	-	416	4	
Sardine	28	46	107	189	11	18	41	79	

cent in value from those in the same period of the previous year. The increase was due to larger purchases of tuna and salmon. The gain was partly offset by smaller purchases of canned sardines.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because data on local purchases are not obtainable.

(2) See Commercial Fisheries Review, June 1964 p. 14.



## Gulf Exploratory Fishery Program

### SHRIMP GEAR STUDIES CONTINUED:

#### M/V "George M. Bowers" Cruise 50--

Phase I (April 16-24, 1964): To continue evaluation of the electrical shrimp trawl was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers. The main objectives were to determine the effectiveness of a mechanical tickler chain in conjunction with the electrical array during daylight fishing, and to evaluate the effectiveness of multiple mechanical ticklers.

Trawling tests were conducted off the Florida coast in the Apalachicola-Carrabelle area. Tows were made in St. George Sound behind Dog Island in 4 fathoms of water. The bottom type was soft mud. A 40-foot flat trawl with 6-foot by 32-inch doors rigged with a tickler chain was fished on the starboard outrigger as standard gear, and the experimental electrical trawl was fished simultaneously on the port side. Drags were of one hour duration. Tests were conducted both day and night. The night drags were

made principally to estimate the quantity of shrimp available in the area.

The three principal comparative evaluations made were: (1) daylight electric against daylight standard trawl; (2) daylight electric against night standard trawl; and (3) multiple mechanical ticklers against a single tickler chain.

Catch results from the 20 comparative daylight drags showed the electrical trawl averaged 77 percent more shrimp than the standard gear with the electrical gear always catching more than the standard. Daylight electric catches ranged from 7 to 19 pounds and averaged 12 pounds.

The daytime electric trawl catches averaged 10 percent less than night catches with the standard gear. Night catches from the 11 drags with standard gear ranged from 7 to 22 pounds and averaged 13 pounds.

The chain tickler behind the electrode array did not appear to improve catches on that type bottom.

Five comparative drags were made to obtain an indication of the effect of two mechanical tickler devices. On all of those drags, the experimental trawl caught less than the standard net indicating no improvement attributable to the double tickling action. The results of those drags were not used in the comparisons above.

#### M/V "George M. Bowers" Cruise 50--

Phase II (May 6-12, 1964): To evaluate the handling characteristics and effectiveness of an electrical shrimp trawl equipped with transverse electrodes in place of the longitudinal electrode array used in previous tests was the primary objective of the second phase of Cruise 50. The vessel operated in the area off Carrabelle, Fla., and returned to port on May 12, 1964.

Dragging trials were conducted in St. George Sound behind Dog Island in 4 fathoms of water. The bottom type also was soft mud. A 40-foot semiballoon trawl with 6-foot by 30-inch doors rigged with a tickler chain was fished on the starboard side as a standard. The experimental gear was fished simultaneously on the port side and was identical except for the electrode array.

Generally, results were the same as achieved with the longitudinal array--daytime

catches with the electrical gear exceeded the daytime catches of the standard gear but were less than the average of the night standard gear catches. Also, night catches with the electrical gear were less than those of the standard gear.

The transverse electrode array design was easily handled with the standard shrimp-trawler rigging.

Further tests of the electrical gear, using a "frame trawl," will be conducted in St. Andrews Bay in the near future to determine: (1) vertical and horizontal escapement levels; (2) optimum electrode length; (3) optimum pulse rate; (4) optimum power level; and (5) relative effectiveness of longitudinal and transverse electrodes.

Note: See Commercial Fisheries Review, April 1964 p. 18.

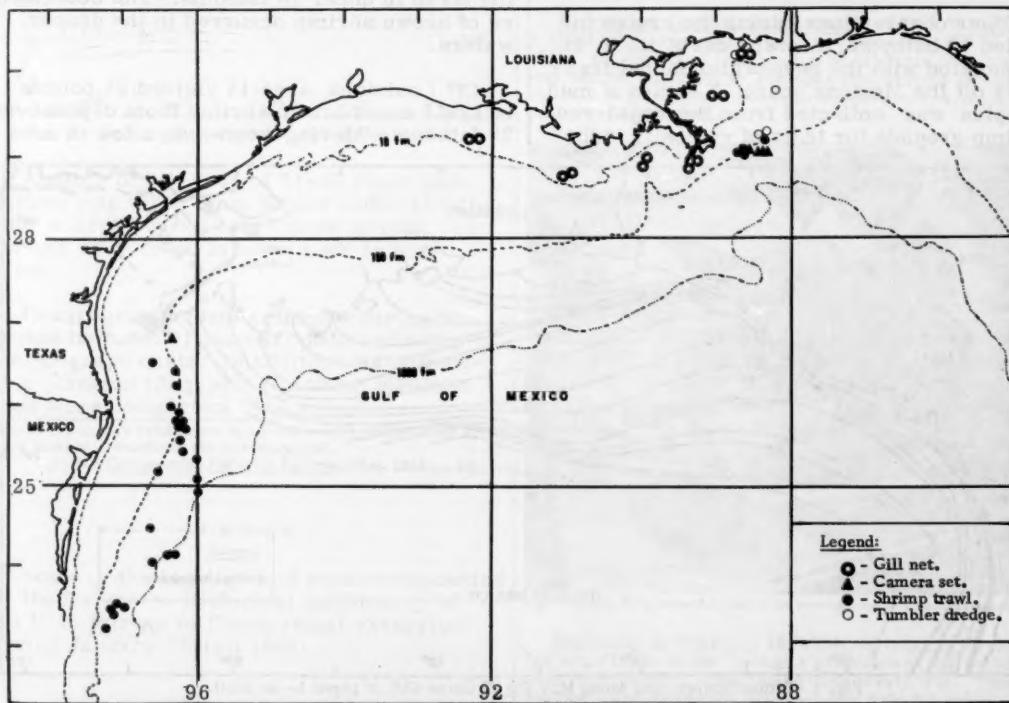
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#### SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO CONTINUED:

M/V "Oregon" Cruise 91 (March 30-April 17, 1964): The main objectives of this 18-

day cruise in the western and southwestern Gulf of Mexico by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) make a preliminary systematic survey of the previously undelineated marine fauna of the international waters from Brownsville, Tex., to latitude 23° N.; (2) obtain motion picture coverage of fauna in the 200-225 depth range; (3) spot check the seasonal abundance of royal-red shrimp resources of the Mississippi Delta and Brownsville areas; and (4) continue investigations on off-season menhaden occurrences along the Mississippi, Louisiana, and Texas coasts.

A total of 24 deep-water faunal transects were made at 100-fathom intervals from 100 to 1,000 fathoms along the Continental Slope off Mexico. Deep-sea snapper (Pristipomoides andersoni) dominated catches from 100 fathoms. Hake (Urophycis sp.) and whiting (Merluccius sp.) were dominant in the 200-300-fathom depth range. Grenadiers (Macrouridae) were predominant in the deeper waters. Because of the unexplored nature of the offshore waters south of Brownsville, specimens collected in that area constituted new distri-



Areas investigated during Cruise 91 by the M/V Oregon (March 30-April 17, 1964).

bution records. Four 400-foot rolls of 16 millimeter film (2 color and 2 black and white) were exposed in the royal-red shrimp depths.

Royal-red shrimp catches from the grounds off Brownsville were very light. The best catches were made off the Mississippi Delta and consisted of 340 pounds of heads-on shrimp from three 3-hour drags in 220-225 fathoms.

Twelve gill-net stations were occupied. At each station, 6 bottom and 6 surface sets were made in depths ranging from 7 to 20 fathoms. The gill-nets used were of No. 7 monofilament nylon thread made up in four 300-foot sections of  $2\frac{5}{8}$ ,  $2\frac{3}{4}$ ,  $2\frac{7}{8}$ , and 3-inch stretched mesh, and one 300-foot section of No. 69, 2 -inch stretched multifilament. The catch of large-scale menhaden (*Brevoortia patronus*) consisted of 30 specimens caught in the surface sets and 23 taken in the bottom sets. (U. S. Bureau of Commercial Fisheries Beaufort Biological Laboratory personnel conducted 25 plankton tows to supplement the studies on Gulf menhaden.)

Other observations during the cruise included 18 bathythermograph casts made in conjunction with the deep-water faunal transects off the Mexican coast. A series of mud samples was collected from the royal-red shrimp grounds for tests of viscosity, adhe-

siveness, and friction. Six tumbler-dredge stations were occupied in various depths to collect live molluscs for study.

Note: See Commercial Fisheries Review, May 1964 p. 21.



## Gulf Fishery Investigations

### SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-16 (April 14-26, 1964): Shrimp sampling in the northwest Gulf of Mexico was continued during this cruise by the chartered research vessel Gus III operated by the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex. Eight statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) were covered. Standard 3-hour tows with a 45-foot shrimp trawl were made.

Although still light, catches were not as spotty as during the previous month's cruise in March 1964. During the April 1964 cruise, white shrimp were encountered in all statistical areas sampled, with the best catches being taken in under 10 fathoms. The best catches of brown shrimp occurred in the deeper waters.

Off Louisiana, area 14 yielded 24 pounds of 12-15 count brown shrimp from depths over 20 fathoms. Moving westward, a tow in area

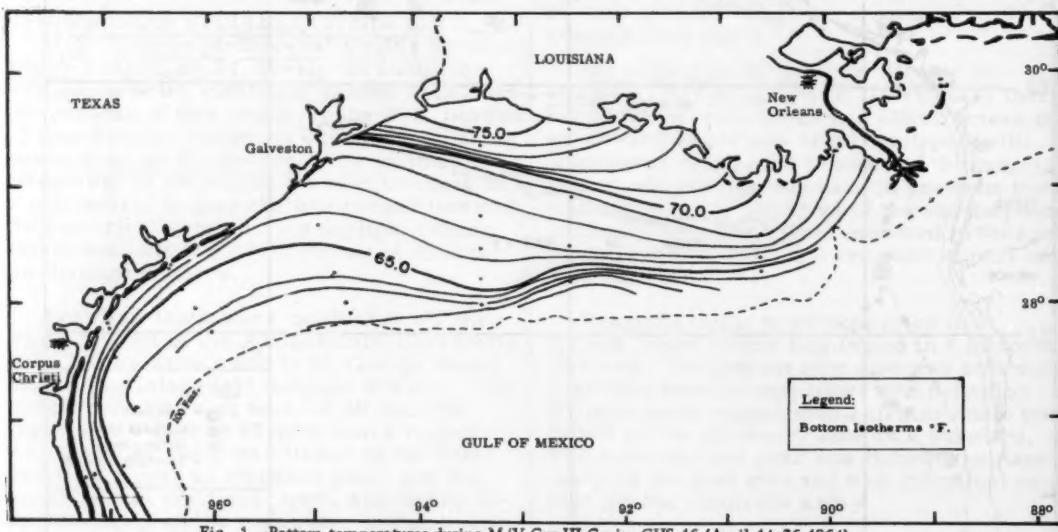


Fig. 1 - Bottom temperatures during M/V Gus III Cruise GUS 16 (April 14-26 1964).

16 produced 20 pounds of 21-25 count white shrimp from depths under 10 fathoms, and area 17 yielded 13 pounds of 26-30 count white shrimp from the depth under 10 fathoms.

Off the Texas coast, area 18 produced 12 pounds of 21-25 count brown shrimp from depths over 20 fathoms and 12 pounds of 31-40 count white shrimp from depths under 10 fathoms. In area 19, the 10-20 fathom range yielded 18 pounds of 26-30 count brown shrimp and 11 pounds of 15-20 count white shrimp. In area 21, a tow in 10-20 fathoms produced 24 pounds of 12-15 count brown shrimp.

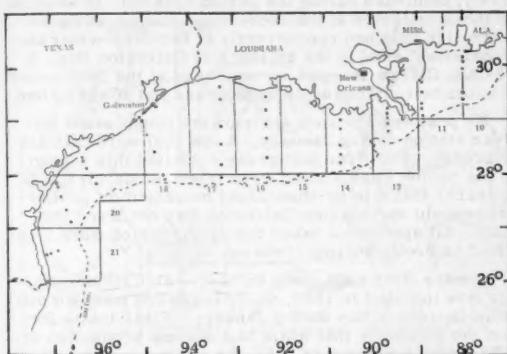


Fig. 2 - Station pattern for shrimp distribution studies.

A catch of 8 pounds of 51-67 count pink shrimp was taken from depths under 10 fathoms in area 20, but only traces of pink shrimp were found in tows made in other areas.

Oceanographic data collected during the cruise included 41 nansen bottle and bathythermograph casts. In addition, 41 oblique-step plankton tows, and 10 bottom plankton tows were completed.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.

(2) See Commercial Fisheries Review, May 1964 p. 22.

\* \* \* \*

Some of the highlights of studies conducted by the Galveston Biological Laboratory of the U. S. Bureau of Commercial Fisheries during January-March 1964:

**SHRIMP BIOLOGY PROGRAM: Shrimp Larvae Studies-Distribution and Abundance:** Examination of 84 plankton samples collected in January and February 1963 showed that although planktonic-stage penaeids were distributed over the entire sampling area, there was a marked decrease in abundance from the high noted in December 1962. Penaeids were slightly more abundant in the offshore waters between Galveston and Port Aransas, Tex., than in waters east or west of that general area.

Larval and postlarval shrimp of the genus *Penaeus* also decreased in numbers with the total catch being about 7 times lower in January and February 1963 than in December 1962.

Mysis and postlarval stages, most abundant at the 15-, 25-, and 40-fathom stations, constituted about 70 percent of the January catch, while in February 90 percent of the sample catch consisted of postlarvae which were most abundant at the 4-, 7½-, and 40-fathom stations.

To investigate the possibility that large concentrations of postlarval *Penaeus* sp. occur on the bottom just prior to their movement into nursery areas, a plankton "sled" was constructed and put into operation early in the quarter. This device consists of a Gulf-V plankton net mounted on ski-type runners. The mouth of the plankton net is about 1 foot off the bottom when the runners are on the bottom. Results of the "sled" tows appear quite promising and use of this gear will continue on an exploratory basis.

**Migrations, Growth, and Mortality of Pink Shrimp:** A third mark-recapture experiment was undertaken to obtain supplemental information on (1) rates of fishing and natural mortality in Tortugas pink shrimp stocks, (2) rate of growth as related to temperature, and (3) pattern of dispersal.

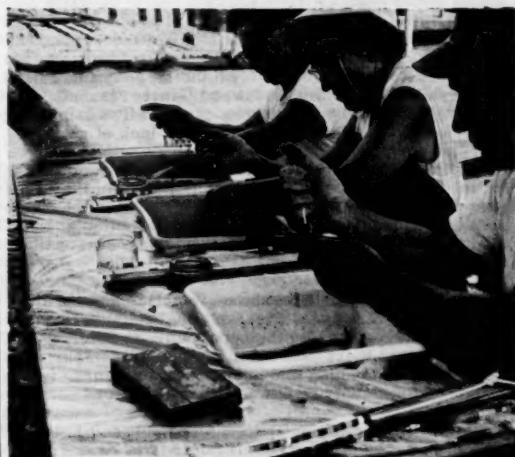


Fig. 1 - Shrimp being stained as part of the investigations on shrimp migrations.

Beginning on February 15, 1964, shrimp for marking were taken on the Tortugas grounds and delivered to a shore base at Stock Island (Key West), Fla. Those shrimp were measured, marked, and held for a few days before release over an area of 50 square miles

near the center of fishing activity on the Tortugas grounds. A total of 964 shrimp, measuring 118-128 millimeters (4.6-5.0 inches) in total length and marked with Trypas blue dye, were released on February 23; 1,392 shrimp measuring 115 millimeters (4.5 inches) or more in total length (approximate sizes retained by the shrimp fishery) and marked with fast green FCF dye, were released on February 24. All releases were made on the bottom by means of a release box. By March 20, a total of 256 recoveries had been verified.

Of 360 seabed drifters designed to measure the direction and speed of bottom currents and released on the Tortugas grounds with the marked shrimp, about 90 had been recovered by commercial fishermen as of April 1.

**Abundance and Distribution of Pink Shrimp Larvae:** Three sampling cruises were completed on the Tortugas shrimp grounds. Bottom temperatures on the first cruise (February 18 and 19) were about 18° to 19° C. (64.4° to 66.2° F.), and few or no pink shrimp larvae or postlarvae were taken.

During the period covered, material contained in 83 plankton samples was sorted and the penaeid shrimp counted and identified. This counting and sorting process has been facilitated by a new technique in which cupric ammonium sulfate is added to the sample to break up filamentous algae and detrital material in the samples. A tentative card format has been developed for computer analysis of plankton data.

The number of pink shrimp postlarvae sampled at the Buttonwood Canal bridge at Flamingo, Fla., was consistently found to be related to current velocity in the canal. When a plankton pump and a conventional plankton net were operated simultaneously, the plankton pump was found to catch more than twice as many pink shrimp postlarvae. (Conducted by University of Miami under contract.)

**Juvenile Phase of the Life History of the Pink Shrimp in Everglades National Park (Fla.) Nursery Grounds:** Routine sampling with the large channel net for juvenile shrimp in Buttonwood Canal, Fla., continued. The use of wing nets as comparative sampling devices was discontinued because of a lack of good correlation between catches by the wing nets and the channel net. The first field tests with a new conical net to determine the distribution of shrimp in the canal have proved promising. Since very few shrimp have been caught during flooding currents, sampling at that tidal stage will in the future be undertaken seasonally rather than monthly.

The U. S. Weather Bureau has installed a recording barometer at Flamingo, Fla., and the data from that facility will now provide the opportunity to determine whether or not there is a relationship between shrimp movement in the canal and barometric pressure. (Conducted by University of Miami under contract.)

**Seasonal Distribution Patterns of Adult and Larval Shrimp in Aransas Pass (Tex.) Inlet:** The "tide-trap" data for May 1963 to March 1964 have been summarized. Peaks in the total biomass moving through Aransas Pass occur during the spring and fall transition periods. In the spring, water temperatures rise and water levels are high, whereas in the fall temperatures and levels both decline. Greatest seaward movement of juvenile brown shrimp and the less abundant pink shrimp usually occurred at the full moon.

Seasonally, both species were most abundant in the Pass from the first week of May through June. Neither was collected between the middle of December and the first of May.

Postlarval brown shrimp moved from the Gulf of Mexico through the Pass in maximum numbers during April, May, and early June. The greatest number of pink shrimp postlarvae was noted in August and September. The two species occurred in about equal numbers in late June, July, and early August. None was found between October and January. White shrimp postlarvae were noted only occasionally. (Conducted by Institute of Marine Science, University of Texas, under contract.)

**SHRIMP DYNAMICS PROGRAM: Surveys of Post-larval Abundance and Fisheries for Bait (Juvenile) Shrimp:** Weekly and semiweekly sampling to determine the abundance of postlarval shrimp as they move through Sabine Pass and Galveston Entrance (Bolivar), respectively, continued during the period covered. In addition to those collected at the shore-zone station, samples were also obtained concurrently at two deep-water stations established in the entrance to Galveston Bay. A 12-inch Clarke-Bumpus net was used at the deep-water stations being fished at the surface and just off the bottom.

No postlarval penaeid shrimp were caught at the Bolivar station during January. A few (19) were taken in February. The first postlarvae collected this season at the Sabine Pass station were taken on March 18. It appeared that a later-than-usual movement of postlarval penaeid shrimp into Galveston Bay occurred this year.. All specimens taken during the period were identified as brown shrimp (*Penaeus aztecus*).

For the first time since extensive statistical coverage was initiated in 1959, no shrimp were taken for bait from Galveston Bay during January. Final totals for last year indicate that while bait shrimp production decreased by 6 percent in 1963, the average catch per unit of effort increased by 13 percent.

Table 1 - Catch and Fishing Effort in Galveston Bay Shrimp Fishery, 1962-1963

Year	Catch Lbs.	Fishing Effort Hrs.	Average Catch Per Hour
			Lbs. 34
1963	1,994,600	29,120	34
1962	1,062,900	33,620	31

**Commercial Catch Sampling:** The normal late-winter period of low shrimp production along the Texas and Louisiana coasts provided an opportunity to analyze data previously collected in those areas. Maps illustrating the spatial distribution of catch and effort in the Texas brown shrimp fishery were constructed for the period August-December 1963. The maps are to be used to relate fishing intensity to changes in shrimp density. Data collected were used to compare statistics of relative size composition of shrimp as determined by the box and machine methods of grading. Results indicated that the two processes give similar results when large numbers of landings are compared. During some parts of the year, however, the reported size composition was found to be biased, presumably as a result of marketing practices.

A canvass of vessels fishing on the Tortugas grounds was continued during the period. Information relative to catch, effort, fishing area, and discards of small shrimp was obtained from more than half of the fishing fleet landing its catch at Key West, Fla. Three trips were made by Bureau personnel on commercial shrimp vessels to obtain data concerning the size of shrimp culled at sea

Migrations, Growth, and Mortality of Brown and White Shrimp: The brown shrimp mark-recapture experiment undertaken off the Mississippi coast in June 1963 was ended, with 429 (9 percent) of the 4,801 stained shrimp recovered. Inspection of the recovery pattern indicated little dispersion of the marked group from its general area of release. Calculations of fishing effort expended in the study area during the study period (June-August 1963) were completed. Examination of the effort indicated that it varied with time and followed a downward trend.

Of the 3,115 stained white shrimp released in Galveston Bay in August 1963, 412 (13 percent) have been returned. Work was completed on the tabulation and calculation of fishing effort expended in the study area. Fishing effort was found to vary with time and declined slowly in magnitude from mid-August through September 1963. Preliminary evaluation of mortality per 10-day interval yielded values of 15 percent for natural mortality and 10 to 18 percent for fishing mortality.

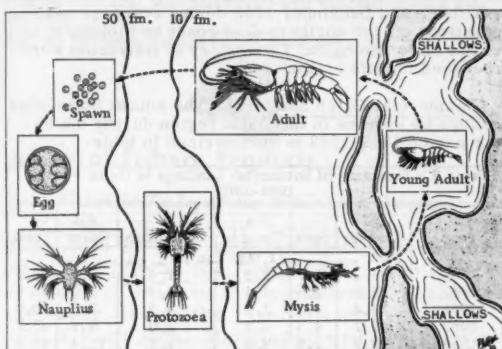


Fig. 2 - Diagram of the life cycle of the white shrimp (*Penaeus setiferus*).

The most direct means presently used for estimating the growth of shrimp is by mark-recapture experiments using biological stains as marks. Because biological stains concentrate in the gills, the question has arisen as to whether or not the stain affects oxygen uptake and, subsequently, metabolism and growth. To answer that question, a series of laboratory experiments was initiated in which the oxygen uptake of whole individuals as well as gill tissue from stained and unmarked shrimp was measured. If the oxygen uptake of stained individuals proved lower than that of unstained shrimp, it could be assumed that stains retard growth. Preliminary results from those experiments indicate no difference in oxygen uptake between stained and unstained shrimp.

Population Dynamics: Studies related to the selective characteristics of shrimp nets and those concerned with the relative fishing power of shrimp vessels were continued. Measurements of a large number of shrimp collected during net trials in fall 1963 were completed. Results from those experiments show that significantly fewer shrimp escape from the body of shrimp nets than from the cod ends. But when nets with meshes as large as  $2\frac{1}{2}$  inches and 3 inches (stretched mesh) are used, about one-third and two-thirds of the 40-count shrimp encountered escape from the body of the net. Almost no marketable shrimp (less than 68 count) escape from nets with meshes measuring  $1\frac{1}{2}$  and 2 inches, the sizes commonly used by commercial fishermen.

An improved method for processing data required to evaluate the comparative fishing power of shrimp boats has been developed. The procedure now in use will make it feasible to compare boats fishing in different geographic areas and on different species of shrimp.

The Seasonal Occurrence, Distribution, and Abundance of Postlarval Brown and White Shrimp in Vermilion Bay (La.): Beam-trawl sampling of postlarval Penaeidae was continued. Three stations were occupied biweekly, a fourth station once a week, and the remainder not at all. Certain stations were not checked according to schedule due to inaccessibility resulting from rough-water conditions. Postlarval brown shrimp first appeared in samples taken on February 24, 1964, at the station in Southwest Pass. (Conducted by University of Southwestern Louisiana under contract.)

Abundance of Postlarval Shrimp in Mississippi Sound and Adjacent Waters: As of the end of March 1964, identification of all postlarval shrimp taken during the study was completed. Specimens in 636 samples included 37,250 penaeids belonging to one of the three major commercial species. Of those, 5,257 were classified as juveniles. Specific composition of the inshore postlarval collections (November 1962-October 1963) and the 1962 commercial landings from Mississippi Sound (Area 011.1) are shown in table.

Table 2 - Mississippi Sound 1962 Commercial Shrimp Landings and Inshore Postlarval Collections

Item	Total	Percent		
		Brown	White	Pink
Commercial landings, 1962 (Headless) in lbs.	201,662	61.0	31.9	6.9
Postlarvae at inshore stations (Nov. 1962-Oct. 1963) no.	25,974	61.3	32.3	6.3

Brown shrimp postlarvae appeared early in February this year and sampling was increased immediately. Some offshore island stations were eliminated and two stations were added to extend the sampling to the mouth of Tchouticabouffa River. Numbers of postlarvae increased rapidly through March. The average catch at stations sampled in both years was more than twice that of the corresponding period in 1963. (Conducted by Gulf Coast Research Laboratory under contract.)

ESTUARINE PROGRAM: Ecology of Western Gulf Estuaries: Systematic data collection according to the plan initiated in January 1963 was refined following completion of sampling operations in February 1964. The addition of 8 marsh stations and 6 plankton stations should provide better biological coverage of the Galveston Bay system, whereas the inclusion of dissolved oxygen, total nitrogen, and phosphate measurements at 40 of the previously established hydrology stations will enhance the water-quality aspects of the overall study. Sampling with small trawls will continue on a monthly basis at 64 of the original 65 stations. Recent acquisition by the Bureau of Commercial Fisheries of the research vessel *Redfish* (a 29-foot inboard cabin cruiser) is expected to greatly facilitate future sampling activity. This vessel was put into service on a trial basis in March and was to be completely outfitted and ready for extensive operation by mid-April 1964.

The total weight and numbers of organisms collected during the period were well below those of the previous quarter. This reduction is attributed to the low water temperatures sustained during January and February, averaging  $10.0^{\circ}$  and  $12.9^{\circ}$  C. ( $50.0^{\circ}$  and  $55.2^{\circ}$  F.), respectively. Temperatures during March increased

significantly, averaging 17.9° C. (64.2° F.), as did the quantity of trawl-caught individuals.

The Atlantic croaker was the dominant species taken in trawl samples throughout the system during the period. The bay anchovy persisted at about the same level as in the previous period. Adult white shrimp and blue crab, which were found in very small numbers during January and February in the deep-water channels, appeared to be slowly moving back into the bay in March. Gravid female blue crabs appeared in March for the first time since November 1963, while adult brown shrimp were very scarce throughout the period. An indication that menhaden had spawned, possibly in November or December, was confirmed by the appearance of large numbers of postlarvae in plankton samples collected during February and March.

Intensive sampling for postlarval brown shrimp throughout the Galveston estuary was initiated on a weekly basis early in March. It is scheduled to continue throughout the period of peak influx of postlarvae and until the young shrimp begin to enter the trawl catches as juveniles. The purpose of this study is to determine the rate of dispersion of postlarval shrimp throughout the system and to establish their relative abundance in the various habitats and areas within the system. As of March 11, 1964, brown shrimp postlarvae were in evidence in small numbers in East and Lower Galveston Bays. A gross examination of samples collected a week later indicated an increase in numbers in those two areas and dispersion throughout most of the estuary. Peak immigration, however, did not appear to have been reached by mid-March.

Number and average weight data for brown and white shrimp collected during 1963 were compiled in terms of unit of effort (5 minutes of trawling) and then grouped by subarea as well as habitat. On an annual basis (1963), the greatest abundance of white shrimp occurred in East Bay, followed in diminishing order by Trinity Bay, Upper Galveston Bay, Lower Galveston Bay, the mouth of the San Jacinto River, and the tidal pass at Galveston Entrance. East Bay also had the highest average catch of brown shrimp followed by Trinity Bay, the mouth of the San Jacinto River, Upper Galveston Bay, Lower Galveston Bay, and the tidal pass. The smallest shrimp, both white and brown, were taken in the upper bays (East and Trinity) while the largest individuals were caught near large oyster reefs in the lower bay areas, in the tidal pass, and in the adjacent Gulf of Mexico. The Gulf Intracoastal Waterway, adjacent to East Bay, yielded high catches of small white and brown shrimp, indicating it is a major transport system from the tidal pass and East Bay to thousands of acres of adjoining and connecting marshes.

The most important habitat for white shrimp seemed to be the system's tertiary bays and bayous as against other habitat types such as the open-water and shoreline areas of the larger bays. In contrast, average catches of brown shrimp from the shoreline areas of the larger bays were as good as those from the tertiary bays and bayous.

**INDUSTRIAL BOTTOMFISH FISHERY PROGRAM:** *Life Histories of Central Gulf Bottomfish:* Length and weight frequency distributions of Atlantic croaker collected during research as well as commercial vessel operations in Mobile Bay, Mississippi Sound, and in the Gulf east of the Mississippi River Delta revealed the presence of three distinctly separate size groups during October 1963. Fish in Mobile Bay and in Mis-

sissippi Sound averaged 12 centimeters (4.7 inches) in total length and 15 grams (0.5 ounce) in weight, and were presumed to be 1 year old. Individuals collected from industrial bottomfish catches made on near-shore grounds (2 to 7 fathoms) in the Gulf averaged 17 centimeters (6.7 inches) and 50 grams (1.7 ounces), and were classified as 2-year-old and older fish. Specimens caught offshore in 15-40 fathoms averaged 20.0 centimeters (7.8 inches) and 83 grams (2.9 ounces), and are considered to have been 3 years old. It is therefore apparent that the fall fishery is dependent upon 2- and 3-year-old fish, while 1-year-old croaker remain largely unavailable. Three-year-old fish in offshore areas do not contribute significantly during the fall season.

Samples of juvenile fish collected in Mississippi Sound and adjacent estuaries during the fall and winter of 1963-64 by personnel of the Bureau of Commercial Fisheries Gulf Coast Research Laboratory working on the postlarval shrimp project were being examined for the presence of croaker. A total of 1,400 croaker taken in October and December 1963 during research vessel operations off the northern Gulf coast by biologists of the Bureau's Biological Laboratory at Galveston were processed for life history data.

**Commercial Catch Sampling:** The annual bottomfish landings by species in the Delta region during the 5-year period 1959-1963 is summarized in table.

Table 3 - Summary of Bottomfish Landings in Delta Region, 1959-1963

Year	Croaker	Spot	Sea Trout <sup>1</sup>	Cutlassfish	All Other	Total
(1,000 Tons)						
1963	25.2	3.7	2.3	1.4	7.0	39.6
1962	27.9	4.5	4.4	2.3	9.2	48.3
1961	22.4	4.3	2.1	2.3	7.2	38.3
1960	19.7	4.5	4.6	2.0	9.9	40.7
1959	20.9	5.6	3.5	1.2	11.4	42.6
Average	23.2	4.5	3.4	1.8	8.9	41.9
Percentage	56	11	8	4	21	-
<sup>1</sup> Sand and silver.						

The industrial fish catch in 1963 (excluding menhaden) dropped 18 percent to about 39,600 tons. At four ports in Louisiana and Mississippi, 2,055 vessel landings represented a 29-percent decrease over 1962. Increased use of tuna, chicken parts, and beef and pork byproducts in canned petfoods was primarily responsible for the drop in the demand for fish. Competition from a growing number of other petfood companies also contributed to the decreased use of Gulf bottomfish. Increasing 6 percent from the previous year, the estimated catch of croaker in 1963 was 64 percent of the total of all fish landed. Spot accounted for 9 percent, sand and silver sea trout combined amounted to about 6 percent, while cutlassfish contributed nearly 4 percent.

Measurements of total catch, relative abundance, and total fishing effort have been completed for the north-central Gulf by month from 1959 through 1962. Analyses of the data according to subareas were partially completed.

**Distribution and Abundance of Western Gulf Bottomfish:** Processing of subsamples of fish collected during the regularly scheduled survey cruises continued. The finfish catch-per-unit-of-effort for 1963 discloses, as did the data for 1962, that the concentration of industrial-type bottomfish is much greater off Louisiana than off Texas.

Table 4 - Industrial-Type Bottomfish Catch Per-Unit-of-Effort, 1963

Area	Depth (Fathoms)				
	4	7	15	25	40
Texas	55	70	75	75	90
Louisiana (West of Mississippi River)	130	225	250	220	130

1/Trawling with 45-foot (flat), 2-inch mesh trawl with rollers.

Observations of an experimental group of Atlantic croaker held in a 28,000-gallon 18-foot high tank of recirculating sea water have indicated that the fish are usually more active when not near the bottom, and that they only infrequently leave the bottom, even during daylight hours, when the water temperature remains as low as it does during the winter season. It appears that the magnitude of their diurnal variation, with reference to the bottom, is related to water temperature. Distinct diurnal variation in sample catches of spot, a closely related species, was observed and studied during an offshore cruise.

Note: See *Commercial Fisheries Review*, March 1964 p. 17.



## Industrial Fishery Products

### U.S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, April 1964: Preliminary data on U.S. production of fish meal, oil, and solubles for April 1964 as collected by the U.S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production<sup>1/</sup> of Fish Meal, Oil, and Solubles by Areas, April 1964 (Preliminary) with Comparisons

Area	Meal Short Tons	Oil 1,000 Pounds	Solubles	Homogenized <sup>3/</sup>
				..... (Short Tons) .....
April 1964: East & Gulf Coasts <sup>2/</sup> . . . . .	5,702	3,248	2,539	-
West Coast <sup>2/</sup> . . . . .	2,625	382	1,575	-
Total. . . . .	8,327	3,630	4,114	-
Jan.-Apr. 1964 Total. . . . .	15,273	6,655	7,359	-
Jan.-Apr. 1963 Total. . . . .	15,902	7,757	7,018	1,250

1/Does not include crab meal, shrimp meal, and liver oils.

2/Includes American Samoa and Puerto Rico.

3/Includes condensed fish.

\* \* \* \*

Production, February 1964: During February 1964, a total of 1,834 tons of fish meal and scrap and 236,000 pounds of marine animal oil was produced in the United States. Compared with February 1963 this was a decrease of 1,013 tons (35.6 percent) in meal production and 88,000 pounds (27.2 percent) in oil production.

The quantity of fish solubles manufactured in February 1964 amounted to 592 tons--631 tons less than in February 1963.

Production of tuna and mackerel meal amounted to 898 tons which accounted for about 49.0 percent of the February meal production. Oil from tuna and mackerel (120,000 pounds) comprised 50.8 percent of the February oil production.

U. S. Production of Fish Meal, Oil, and Solubles, February 1964<sup>1/</sup> with Comparisons

Product	February			
	1/1964	1963	Jan.-Feb. 1964	Total 1963
..... (Short Tons) .....				
<b>Fish Meal and Scrap:</b>				
Herring . . . . .	2/	-	2/	2/ 7,537
Menahaden <sup>3/</sup> . . . . .	-	-	2/	- 181,750
Sardine, Pacific . . . . .	-	-	1	-
Tuna and mackerel . . . . .	898	2,222	2,022 3,930	26,957
Unclassified. . . . .	936	625	1,706 1,202	25,208
Total . . . . .	1,834	2,847	3,729 5,132	241,452
Shellfish, marine-animal meal and scrap . . . . .	4/	4/	4/	4/ 12,000
Grand total meal and scrap . . . . .	4/	4/	4/	253,452
<b>Fish Solubles:</b>				
Menahaden . . . . .	2/	-	2/	74,831
Other . . . . .	592	1,223	1,682 2,595	25,347
Total . . . . .	592	1,223	1,682 2,595	100,178
Homogenized condensed fish . . . . .	-	-	- 50	7,224
..... (1,000 Pounds) .....				
<b>Oil, Body:</b>				
Herring . . . . .	2/	-	2/	2/ 5,709
Menahaden <sup>3/</sup> . . . . .	-	-	2/	- 167,635
Sardine, Pacific . . . . .	-	-	-	-
Tuna and mackerel . . . . .	120	254	577 544	5,735
Other (including whale) . . . . .	116	70	368 204	6,555
Total oil . . . . .	236	324	945 748	185,634

1/Preliminary data.

2/Includes with unclassified.

3/Includes a small quantity of thread herring.

4/Not available on a monthly basis.



## Maine Sardines

### CANNED STOCKS, APRIL 1, 1964:

Canners' stocks of Maine sardines on April 1, 1964, were 41,000 cases less than those on hand April 1, 1963, but were 613,000 cases above stocks on hand two years ago on April 1, 1962 (the pack for the 1961 season was unusually small).

The 1963 season pack totaled 1,584,000 standard cases, according to the Maine Sardine Council. On April 15, 1963, carryover stocks at the cannery level amounted to about 660,000 cases. Adding the 1963 season pack results in a total supply of 2,244,000 cases as of April 1, 1964--up 4.4 percent from the total supply of 2,150,000 cases reported April

Canned Maine Sardines--Wholesale Distributors' and Canners' Stocks, April 1, 1964, with Comparisons <sup>1</sup>													
Type	Unit	1963/64 Season			1962/63 Season					1961/62 Season			
		4/1/64	1/1/64	11/1/63	7/1/63	6/1/63	4/1/63	1/1/63	11/1/62	7/1/62	6/1/62	4/1/62	1/1/62
Distributors	1,000 actual cases	291	261	308	217	215	264	271	230	134	99	148	193
Canners	1,000 std. cases <sup>2</sup>	658	1,063	1,255	643	536	699	1,092	1,348	374	50	45	144

<sup>1</sup>Table represents marketing season from November 1-October 31.  
<sup>2</sup>1/100 3 1/2 oz. cans equal one standard case.

Note: Beginning with the Canned Food Report of April 1, 1963, U. S. Bureau of the Census estimates of distributors' stocks were based on a revised sample of merchant wholesalers and warehouses of retail multiunit organizations. The revised sample resulted in better coverage. The January 1, 1963, survey was conducted with both samples to provide an approximate measure of the difference in the two samples. That survey showed that the estimate of distributors' stocks of canned Maine sardines from the revised sample was 13 percent above that given by the old sample.

Source: U. S. Bureau of the Census, Canned Food Report, April 1, 1964.

1, 1963, and higher by 98.9 percent from the short supply of 1,128,000 cases of April 1, 1962.

Note: See Commercial Fisheries Review, March 1964 p. 22.



## Marketing

### EDIBLE FISHERY PRODUCTS, 1963:

The total supply of edible fishery products for 1963 (domestic catch plus imports) dropped about 3 percent below the record high of 1962. On a round-weight basis (as caught), United States imports of fishery products accounted for 45 percent of the edible supply and domestic landings accounted for 55 percent. This was a record high proportion for imports and a new low for United States fishery landings.

The 1963 edible fish landings by United States fishermen declined about 85 million pounds from 1962. Landings were sharply lower for salmon, whiting, ocean perch, Pacific mackerel, haddock, Maine herring, blue crab, and Pacific sardines. Increased landings of shrimp, king crab, and yellowtail flounder partially offset the declines. The United States landings of edible fish and shellfish have trended downward since 1950.

The United States per capita consumption of fishery products declined slightly to 10.6 pounds in 1963, and no appreciable change is in prospect for 1964.

United States holdings of fishery products in cold storage early in 1964 were a little above a year earlier, indicating an adequate supply until commercial landings increase seasonally. Stocks of frozen ocean perch and cod fillets and steaks were well above the same period last year and inventories of halibut and shrimp were substantially higher. Among the canned fishery products, shrimp and canned pink salmon stocks were larger than the same period a year earlier.

In general, retail prices of fishery products are more favorable for the American consumer than a year earlier. They were expected to hold about steady through the second quarter of 1964.

Note: This analysis was prepared by the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the Department of Agriculture's May 1964 issue of the National Food Situation (NFS-108).



## Michigan

### SPORT FISH SURVEY IN GREAT LAKES WATERS:

An inventory of the sport fishing potential in Michigan's Great Lakes waters was begun in the spring of 1964 by the Michigan State Department of Conservation. The survey is part of a broader effort to develop an improved program of commercial and sport fisheries management of the inshore waters of the Great Lakes.

At the start, the inventory program was devoted to examining the backlog of available information, and to setting up a field crew for exploratory fishing. For the next several years, the exploratory team will carry on a systematic study of Great Lakes inshore waters to find new areas for sport fishing. (News Bulletin, Michigan Department of Conservation, April 23, 1964.)



## Minnesota

### REGULATIONS FOR FISH-PROCESSING ESTABLISHMENTS:

The Minnesota State Department of Agriculture published rules and regulations in early 1964 relating to fish-processing establishments. Included in the new rules and regulations are stipulations requiring a permit to process fish for sale at wholesale. The

permit must be renewed annually and the renewal is subject to satisfactory sanitary conditions of the plant. The regulations cover construction of buildings and structures, water supply, sanitary facilities and accommodations, processing equipment, operations and operating procedures, and health of personnel.



## National Fisheries Center and Aquarium

### DESIGN PROGRAM BEING PREPARED:

An architectural firm in Bryan, Tex., has been selected to prepare a design program for the National Fisheries Center and Aquarium to be built in Washington, D.C., the General Services Administration (GSA) and U.S. Department of the Interior announced on May 8, 1964. The Public Buildings Service of GSA negotiated a \$50,000 contract with the Texas architectural firm to prepare proposals for allocating facilities within the Fisheries Center for convenience of public viewing and operations.

The design program was expected to be completed by June 1964. After approval, the program would serve as the basis for architectural design of the Fisheries Center. The design will be done by two firms selected earlier. The design program will include recommendations for traffic access to the aquarium site in East Potomac Park, parking accommodations, and other aspects of site development at Hains Point, a short distance south of the Nation's Capitol. The program also will make recommendations for the placement of facilities according to their relationship within the Fisheries Center, such as the type and location of display areas, public viewing facilities, research laboratories, and feed rooms and water supply for aquatic animals.

The National Fisheries Center which will cost an estimated \$10 million and show about 1,300 different kinds of aquatic life is expected to be completed in late 1967. Legislation by Congress in 1962 which authorized the Fisheries Center requires that it be self-supporting. Construction and operations costs are to be paid from an admission charge to all except supervised youth groups.

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### RESEARCH FACILITIES TO BE EXTENSIVE:

The National Fisheries Center and Aquarium being designed for construction in Washington, D.C., will serve the dual function of an educational center and aquatic research institution. It promises to be outstanding in both fields, the U.S. Department of the Interior reported on May 10, 1964.

The self-supporting Fisheries Center will display one of the world's largest collections of aquatic life in near-natural habitat, ranging from dolphins to barnacles. Behind the scenes, but basic to operation of the Center, will be research accommodations for 32 scientists. They will be drawn from several agencies of the Federal Government, from private institutions and universities, and from foreign countries.

The National Fisheries Center will be operated by the Interior Department's Bureau of Sport Fisheries and Wildlife. Scientists of that Bureau will conduct research in genetics, reproduction, nutrition, fish diseases, experimental ecology, behavior of aquatic organisms, and production of antibiotics and chemicals by marine animals. Secretary of the Interior Stewart L. Udall said the broadly based research program is expected to make important contributions to the fishery sciences and to human health. Some of the studies may have application in national defense. The Office of Naval Research, for example, seeks answers to some of its most vexing problems through biological research on marine organisms. The studies may lead to better vessel design, more efficient underwater communications, and better protection against dangerous forms of sea life. Several other Government agencies have also been interviewed by the Acting Director of the Fisheries Center to learn how the new facility can serve their research programs.

The head of the Biology Branch, Office of Naval Research, proposed that the Fisheries Center include facilities for growing and maintaining marine invertebrates, such as squid and barnacles. He said a problem common to all such research is a shortage of healthy marine animals and plants for experiments. If the National Fisheries Center can help ease this shortage, he said, it would provide a valuable service to the country's scientific community. The squid is of special research importance because its large central nerve fiber permits a variety of experi-

ments. Also needed is a better supply of the Nubilis barnacle, because of its large muscle sheath.

The Hydrobiology Research Program of the Office of Naval Research is supporting more than 120 basic research projects in academic and industrial institutions in the United States and abroad. One of the most important quests is for ways to prevent the fouling of ships and underwater equipment. The Naval Research official said more than 2,000 marine plants and animals have been implicated as fouling pests. The cost to the U. S. Navy alone for protecting ships, waterfront structures, and other equipment from these pests is about \$100 million a year.

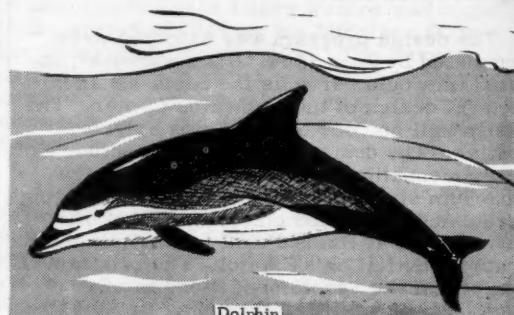
The continued development of new kinds of underwater equipment will further increase the cost. Both the military and industry are beginning to place large stationary structures on the bottom of the ocean, or close to the bottom. These include acoustic devices and other instruments for geophysical and marine biological exploration. Once the structures are submerged, it will be impossible in some cases to retrieve them for maintenance and repair. There will be no way to clean off accumulated marine organisms that could impair operation of the equipment. The solution appears to be in long-life protection against fouling. The research approach is to learn more about the steps or links in the chain of biological processes which govern the life of the offending organisms. Scientists hope that weak biological links can be found and that they will offer a key to control methods.

Another research objective is to find ways to repel or deter dangerous forms of marine life which hamper underwater and amphibious operations. Better protection is needed against sharks, barracuda, moray eels, and other carnivorous marine species. Researchers are also looking into the problem caused by a variety of poisonous organisms in the sea.

Scientists are trying to learn more about the ability of some marine organisms to emit light so this phenomenon can be controlled. During World War II, several ships were attacked because the wake of their propellers churned up the organisms and caused them to glow in the dark. The intensity and rate of biological light emission was also said to be a useful tool for measuring energy con-

version in living tissue. This information is acknowledged to be important to a variety of biomedical investigations. There is interest in the ability of some marine animals to navigate over long distances with extreme accuracy and in their ability to communicate efficiently with each other. The U. S. Navy hopes that by discovering the biological basis for these capabilities, it may be able to simulate some of the desirable features by mechanical or electronic means.

A marine species of particular interest is the dolphin, which has a remarkably well-developed natural sonar. The dolphin uses its echo-ranging ability to find food and to avoid obstructions in murky water. Some experiments indicate that it can even distinguish the shape and texture of hidden objects. It is generally conceded that the dolphin's natural sonar is far superior to the manmade version. The hydrodynamics of the dolphin also offers a promising field of research. The dolphin swims through water with an almost complete absence of drag. When researchers find out how, the answer may result in better design for both surface vessels and submarines.



Dolphin

Other areas of scientific interest include the ability of some aquatic organisms to dive deeply without the adverse effects sometimes suffered by human divers. There also is interest in the development of artificial gills to obtain oxygen from water, and the use of algae to purify air in underwater equipment.

The Acting Director of the National Fisheries Center said that the new facility will provide every possible assistance to the Office of Naval Research in reaching its research objectives.

Note: See Commercial Fisheries Review, May 1964 pp. 26 and 27; April 1964 p. 22.

## North Atlantic Fisheries.

Developments in the North Atlantic fisheries as reported by the U. S. Bureau of Commercial Fisheries North Atlantic Regional Office, Gloucester, Mass., May 13, 1964:

**SOVIET FISHING VESSELS RETURN TO NEW ENGLAND WATERS:** About 60 Soviet fishing vessels and support craft returned to the fishing grounds off New England during the last week in April 1964, after a winter during which few foreign vessels were seen. A total of 32 Soviet factory stern trawlers, 25 side trawlers, and 5 refrigerated fish transports were observed fishing for whiting 130 miles east of Nantucket Island. From 10 to 15 Soviet trawlers were also seen fishing for scup (porgy) off the coast of Virginia and North Carolina.

**HADDOCK AND WHITING ABUNDANCE ON GEORGES BANK HOLDING UP DESPITE HEAVIER FISHING:** Fishing vessels of 9 nations fished on Georges Bank during 1963. They were from Canada, U. S. S. R., Poland, Germany, Japan, Norway, Denmark, United Kingdom, and the United States. Despite such heavy fishing pressure, haddock stocks are holding up well, and the large 1963 year-class is expected to enter the fishery next year (1965). No evidence has been noted of a serious decrease in the abundance of whiting. Fluctuations in yellowtail flounder stocks, fished heavily by United States fishermen, do not appear to be closely related to fishing effort. Estimates of the abundance of various species of groundfish by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, Mass., are greatly facilitated because of the Bureau's new research vessel Albatross IV.

**SIGNAL USED TO INDICATE U. S. VESSEL IS FISHING:** United States vessels fishing close to the Soviet fishing fleet this summer are asked to display a basket in their rigging. It is the only signal Soviet vessels will recognize that another vessel is fishing and thereby yield the right of way.



## North Atlantic Fisheries Investigations

### NORTHERN EDGE OF GEORGES BANK SURVEYED:

M/V "Albatross IV" Cruise 64-6 (April 23-May 6, 1964): To obtain pictures of fish

on or near the bottom, to conduct a special sampling experiment, and to tag blackback flounders at the Northern Edge of Georges Bank was the purpose of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.

A total of 80 survey stations were completed on this cruise, 526 blackback flounders were tagged, 20 camera lowerings were made, and 400 haddock scales and 120 argentine otoliths were collected. A temperature-recording buoy was set near Block Island, and bathythermograph lowerings were made throughout the cruise.

The results of this survey by the Albatross IV will be known following further analysis of data collected. Films from the underwater camera showed that turbidity was a major problem in obtaining photographs of fish or bottom.

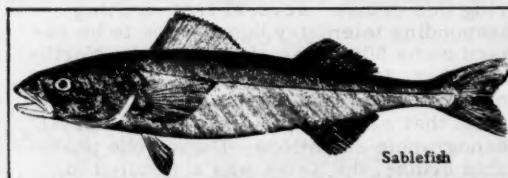
Note: See Commercial Fisheries Review, June 1964 p. 21.



## North Pacific Exploratory Fishery Program

### DEMERSAL FISH OFF SOUTHERN WASHINGTON SURVEYED:

An investigation of the demersal fish of the continental slope off southern Washington was started April 13, 1964, when the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb left her base at Seattle, Wash.



Sablefish

During the early phase of the investigation a series of tracklines was run to establish the bottom topography of the region and to determine areas where potential experimental fishing could be conducted. Some of the first experimental drags made at depths greater than 300 fathoms yielded catches of sablefish exceeding 1,200 pounds an hour. Relatively large concentrations of ocean perch were also found (3,000 pounds per hour tow) near the continental break at depths of about 105 fathoms.



## Oceanography

### OBSERVATIONS IN PACIFIC NORTHWEST COASTAL WATERS BY BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL:

**M/V "George B. Kelez" Third Oceanographic Cruise:** To develop a capability for handling and tracking buoys was the primary objective of this oceanographic cruise in Pacific Northwest coastal waters by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez. The vessel left her base at Seattle, Wash., on April 17, 1964, for this third scheduled cruise. Physical, chemical, and biological observations at a number of stations within 550 miles offshore of British Columbia, Washington, and Oregon, were to be made.



U. S. Bureau of Commercial Fisheries research vessel George B. Kelez.

The Kelez was to initiate a new project during this cruise--several free-drifting transponding telemetry buoys were to be released some 500 miles off the Pacific Northwest coast. It is anticipated that this new project will lead to the establishment of a system that will permit forecasts of coastal oceanographic conditions. During one phase of this cruise, the Kelez was scheduled to make closely-spaced oceanographic observations with the Oregon State University research vessel Acona.

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### BUREAU OF COMMERCIAL FISHERIES RESEARCH VESSEL "GERONIMO" MAKES NEW DISCOVERIES:

The probable discovery of a new ocean current and the finding of an unusually "hot ocean area," were the results of a four-month

oceanographic research cruise (EQUALANT III) off the central west coast of Africa by the research vessel Geronimo, operated by the Washington, D. C., Biological Laboratory of the U. S. Bureau of Commercial Fisheries. The discovery of a new ocean current is relatively rare with only a few having been found in the past 50 years.

Scientific personnel aboard the Geronimo had first indications of a westerly flowing undercurrent in the Gulf of Guinea in September 1963 when EQUALANT II (the second phase of the International Cooperative Investigations of the Tropical Atlantic) was being completed, and the Syncor II communications satellite transmitted oceanographic data for the first time. On that voyage, test equipment dropped from the vessel into the easterly flowing Guinean Current was unexpectedly pulled to the west at the end of long wires.

On the last cruise completed May 12, 1964, as part of EQUALANT III, the Geronimo went back to the Gulf of Guinea and obtained additional data which supports the probable existence of the newly discovered current. The Director of the Bureau's Biological Laboratory at Washington, D. C., said a current meter aboard the vessel did not function properly, but other measurements indicated that the undercurrent is from 50 to 80 feet below the ocean surface. He said no data have been obtained on the dimensions and velocity of the current but that further studies will probably be made in the fall of 1964 or the following spring.

The chief of the scientific group aboard the Geronimo on this recent voyage said the so-called ocean "hot spot" was found early in February 1964, and began about 30 miles southeast of Cape Three Points, Ghana. The hot ocean area measured about 60 miles in diameter and extended to a depth of about 30 feet. The water temperature in the area was 88° F., 6 degrees higher than the surrounding ocean. That warmer area was reported to be virtually without motion and may have resulted from a surrounding counter-clockwise eddy.

The Geronimo's chief scientist said there was an unusually large concentration of tuna at one point on the edge of the "hot spot," and that this apparently was associated with an adjacent upwelling of water from the ocean floor which brought nutrients to the surface. The "hot spot" disappeared 10 days after it was discovered by the Bureau's research ves-

sel. Further study is to be made in that area to learn if the heated water recurs. Tuna fishing in the area of the discovery is said to be traditionally good, and this may be related to a recurrence of the separate warmer water area.

Other oceanographic research vessels which participated in the most recent study of ocean currents and fishery resources in the area off the African Coast were sponsored by the University of Miami and the Governments of Ghana, Congo-Brazzaville, Spain, Republic of Ivory Coast, and the Soviet Union. Note: See Commercial Fisheries Review, December 1963 pp. 37 and 60.

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#### TWO NEW ENGLAND UNIVERSITIES MAY ADD MARINE SCIENCE PROGRAMS:

The University of Massachusetts at Amherst has set up a commission to study the feasibility of establishing a fishery technology school. Also, the University of Maine is considering the addition of a marine laboratory. The plans of both schools have been discussed with the U. S. Bureau of Commercial Fisheries.

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#### RHODE ISLAND UNIVERSITY RECEIVES FUNDS FOR GRADUATE RESEARCH TRAINING GRANTS:

A total of \$166,380 has been awarded to the University of Rhode Island Graduate School of Oceanography by the National Institutes of Health to provide graduate research training grants, announced the dean of the University's Graduate School on May 21, 1964. It is the largest amount for that purpose ever received by the school.

Starting July 1, 1964, the grants will be used to provide financial support for 20 graduate students (mostly doctoral candidates) during the next five years. In addition, the funds will defray the costs of student training cruises aboard the University of Rhode Island research vessel Trident, the purchase of some equipment and supplies, and also help meet some of the Graduate School's operating costs through an "overhead" allowance. The School's dean said they "have been in considerable need of a financial assistance program for graduate students and that the lack of sufficient funds for that purpose has been an obstacle to enrolling many of the qualified students who apply each year."

There are now 41 graduate students at the School of Oceanography, who are assisted directly or indirectly by the University of Rhode Island, the National Defense Education Act, the U. S. Bureau of Commercial Fisheries, the Atomic Energy Commission, the Office of Naval Research, and others.

The grants by the National Institutes of Health will mean five additional students will be on campus the first and fifth years of the program. During the middle three years of the undertaking, 10 additional students each year will increase enrollments some 25 percent. Each will receive funds for the calendar year totaling \$3,000. It is expected the students will be on campus for two years each.

The dean of the Graduate School said that "oceanography has a direct bearing on public health problems. The inevitable direction of flow of all industrial and domestic wastes is into the estuarine and subsequently into the coastal marine environment. To understand how these wastes may be dissipated and perhaps converted, absorbed, or dispersed in the environment, requires broader knowledge of estuarine and coastal exchange, flushing, and other circulation processes."

This latest training grant raises to more than \$1 million the amount received in grants by the Graduate School of Oceanography in a period of several weeks. Earlier the National Science Foundation had awarded \$850,000 to the School for the construction of a new laboratory-office building to be built on the University of Rhode Island Narragansett Bay Campus.

Note: See Commercial Fisheries Review, January 1964 p. 27.

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#### NEW RESEARCH LABORATORY DEDICATED AT WOODS HOLE OCEANOGRAPHIC INSTITUTION:

A new \$2-million research laboratory of the Woods Hole Oceanographic Institution was formally dedicated May 8, 1964, at Woods Hole, Mass. Named the Laboratory for Marine Sciences, the new 3-story building contains 45,000 square feet of floor space and was designed to accommodate the marine biology and chemistry departments of the Institution. Some of its special features include: 23 temperature- and humidity-controlled instrument rooms; 5 "environmental" rooms which can maintain any temperature from 0° to 40° C. (32° to 104° F.); rooms for frozen storage of



The modern building in the right foreground is the Woods Hole Biological Laboratory of the U. S. Bureau of Commercial Fisheries. To the left of the Laboratory is the Woods Hole Oceanographic Institute. The vessel in the foreground is the Albatross IV, the Federal Government's most modern fishery research vessel.

marine specimens; a large aquarium room with running sea water at regulated temperatures; a dissecting room; and an auditorium.

An afternoon session of the dedication was devoted to the presentation of papers by members of the Institution's scientific staff. The following papers were delivered: "The Organic Chemistry of a Fossil," "The North Atlantic Continental Shelf," "Diving and the Physiology of Marine Animals," and "Exchanges of Energy between Air and Sea." (Woods Hole Oceanographic Institution.)

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#### UNIVERSITY OF MIAMI RECEIVES NEW RESEARCH GRANTS FOR STUDIES IN MARINE BIOLOGY:

The National Science Foundation has awarded the Institute of Marine Science, University of Miami, a \$230,000 grant for research at sea aboard the Institute's 176-foot research vessel Pillsbury and aboard smaller

vessels of the Institute. The work will include collection and study of crustaceans and planktonic organisms from the Straits of Florida; studies on the migration and growth of marlin, sailfish, and other large oceanic fish, and the effect of the Gulf Stream upon their distribution; a study of squid and octopus, and shark investigations to determine their reaction to sounds played back into the water in the open ocean.

The Director of the Institute of Marine Science stated that the grant specifically provides for the cost of operating Institute ships for biological purposes as far afield as Brazil and West Africa, but also in Florida, Caribbean, and Bermuda waters.

Another grant, in the amount of \$62,500, was awarded to the Institute of Marine Science to provide special equipment for behavior studies of fish and invertebrates in the Institute's newly completed controlled environment building. The new equipment will

make it possible to keep fish, shellfish, and other experimental marine animals alive under a wide variety of accurately controlled conditions. Temperatures will be regulated to a fraction of a degree, while oxygen, salinity, light, and other variables can also be strictly controlled. In the new building, studies will be made on the reactions of fish to different types of light and sound, their hearing ability and color vision, their behavior under a variety of conditions including weightlessness, and the manner in which they orient to changing conditions. Work will also be carried out upon the reactions of commercial species of shrimp. (University of Miami, April 29, 1964.)

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#### **NEW MARINE LABORATORY BUILDING PLANNED AT UNIVERSITY OF MIAMI:**

A grant of \$1,040,000 from the National Science Foundation will make possible the construction of a new laboratory building for the Institute of Marine Science, University of Miami. The new building at the Institute will house the entire Division of Physical Sciences which carries out research upon currents, waves, tides, underwater sound and light, the chemistry of sea water and sediments, the topography and composition of the deep-sea floor, and other studies. With the construction of the new laboratory, many of the activities of those various research programs can now be concentrated in a single location.

To be completed and in use by the spring of 1965, the new laboratory will consist of 3 stories and will have about 30,000 square feet of working space. The ground floor will contain model basins and pressure tanks, including space for a rotating tank and a soundproof chamber. Tanks will be used for calibration of instruments and also to simulate some conditions of the open sea for experimental purposes. The second and third floors will house offices and laboratories, classrooms, a computer room, chartroom, draftroom, and a radio communications center for maintaining contact with the Institute's fleet of research vessels.

The President of the University of Miami stated that the new facility will allow certain Institute programs to make much more rapid progress than heretofore has been possible. (University of Miami, April 24, 1964.)



#### **Ohio**

##### **COMMERCIAL FISHERY LANDINGS, 1963:**

Commercial fish landings at Ohio ports of Lake Erie during the 1963 fishing season (March 15-December 20) totaled 14.2 million pounds, about one million pounds or 6.6 percent less than in 1962. There was an appreciable drop in landings of carp (2.5 million pounds) and yellow perch (4.5 million pounds) from the previous year, but landings of sheepshead (up 18 percent) and yellow pike (up 90 percent) increased.



Leading species landed in 1963 were yellow perch (4.5 million pounds), sheepshead (4.0 million), carp (2.5 million), catfish (1.0 million), white bass (1.0 million)--these accounted for about 90 percent of the total landings. Landings of blue pike and whitefish, once important commercial species in Lake Erie, were down to only a few hundred pounds.



#### **Oregon**

##### **RECORD SILVER SALMON RELEASE FROM STATE HATCHERIES:**

A record release of 10.4 million silver salmon yearlings from Oregon Fish Commission hatcheries during the liberation season from November 1963 to May 1964 has been announced by the Commission's fish culture director. Coastal areas received 2.3 million of the fish while 8.1 million went into Columbia and Willamette River tributaries.

In addition to the yearlings which were reared to seaward migrant size, some 10 million salmon fry (surplus to hatchery needs) were placed in selected streams, ponds, and lakes for natural rearing under "wild" conditions. Areas for liberation of zero-age fry were selected on the basis of fish production

potential after thorough biological investigation. That was in contrast to indiscriminate planting of fry which characterized fish-cultural operations in many places during earlier times when large numbers of newly hatched fry were dumped with little more basis than hope that they would survive.

This season's release of 10.4 million yearlings tops the previous record of 8.5 million silver salmon released last season by the Oregon Fish Commission. Emphasis during recent years on release of yearling fish ready for seaward migration appears to be playing an important role in the increasing success of the silver program, the Commission's fish culture director indicated. He reported increasing annual returns of adult silver salmon to the hatcheries totaled 22,544 in 1961, 36,107 in 1962, and 44,840 in 1963. He also cited improved disease control and superior nutrition during the year or more the fish are held in the hatcheries and good ocean survival conditions as factors in the success of the hatchery program. (Oregon Fish Commission, May 4, 1964.)

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#### FISH DISEASE STUDY CENTER OPENED:

The Oregon Fish Commission has established an Infectious Disease Study Section to investigate and control fish disease. The new unit will be directed by an expert in the field of medical research who will be assisted by a resident staff of five fisheries scientists. The section is housed principally in a new laboratory building at the Commission's Clackamas Research Center.

The fisheries disease work is divided, much as human investigation might be, into diagnostic and research areas. The diagnostic division at the laboratory is concerned principally with the diagnosis of disease in juvenile salmon and steelhead in hatcheries. Fishery scientists, in the role of medical examiners, determine the problem and prescribe treatment. Various antibiotics and drugs are administered through the diet by way of specially prepared pellet foods or by solutions introduced into the water in which the fish live.

Research in the infectious disease section deals primarily with controlling diseases in adult fish which return to Commission hatcheries to spawn. Most of the large fish are held in ponds until "ripe" and ready to re-

lease their eggs. In one species, the spring chinook, the holding period may be as long as 5 months, allowing ample opportunity for disease and parasitism to infect and kill the important parent fish. Treatment of spawners is mainly external as adult salmon ingest no food after returning to fresh water.

As hatcheries gain increasing importance in maintaining anadromous fish runs, the speedy diagnosis and control of disease assumes new consequence. As in human populations, the forced concentration of thousands of individual fish in a small area increases many fold the chance for epidemic outbreaks of disease. The new laboratory will be a formidable tool in removing causes of mortality in hatchery-reared salmon and steelhead. Close liaison is kept with the superintendents of Commission hatcheries to keep them aware of late developments, as well as to receive the earliest possible warnings of disease problems. Discoveries made in the Clackamas Laboratory could also lead to increased production in the many natural salmon spawning and rear ing streams of the Northwest.

The fishery infectious disease center has specialized equipment and a unique spring water source. The Center has an elaborate water-temperature control system which can simultaneously supply 4 strong and continuous flows of water, each with its own precise wa ter temperature of less than 1° F. variation and in a range of from 35° F. to above 100° F. Each of the 4 separately adjustable flows can supply a separate aquaria.

In conjunction with the Clackamas Center, Oregon Fish Commission contract research



on virus diseases and tissue culture is being carried on at Oregon State University. Six other Fish Commission research laboratories supplement the infectious disease investigations. A mobile diagnostic laboratory mounted on a truck should be ready for use later this year and will be equipped with the tools necessary for field study at the hatchery sites.

At present, 93 percent of the entire Oregon Fish Commission budget and 85 percent of its

research budget is spent on programs to enhance the runs of salmon and steelhead. (Oregon Fish Commission, May 4, 1964.)

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#### FISH AND WILDLIFE KILLS BEING INVESTIGATED:

The opening of a field office and laboratory in Klamath Falls, Oreg., in June 1964, to investigate the cause of fish and wildlife kills in that area, was announced on May 21 by the U. S. Public Health Service, Department of Health, Education, and Welfare. The fish and wildlife deaths are believed to have been caused by the runoff of chemicals into the river basin or by agricultural practices in the area. There have also been reports of persons in the area contracting dermatitis, a skin irritation.

The investigation is to be handled by the Division of Water Supply and Pollution Control. Scientists will also study the area's algae growth, which has reportedly reached nuisance proportions. The complete study is expected to take four years and will also include the land areas drained by Lost River.

Headquarters for the project is in San Francisco, Calif., and preliminary work was begun there in December 1963. The project's work will be coordinated with the Corvallis Laboratory at Corvallis, Oreg. The project staff will consist of 8 engineers and scientists in the initial phase of the study (scheduled to begin in June) and entails data collection and analysis of the Klamath Lake and Lost River system.

The investigation was begun at the request of the U. S. Fish and Wildlife Service and the States of California and Oregon. It is to be operated in conjunction with work being done by the Fish and Wildlife Service.



**Salmon**

#### INDUSTRY-GOVERNMENT PROMOTION CAMPAIGN:

An industry-Government promotion campaign to move the liberal stocks of canned pink salmon into trade channels was announced by Secretary of the Interior Stewart L. Udall on May 15, 1964. The Department's Bureau of Commercial Fisheries will cooperate with

the Alaska canned salmon industry in the campaign. Fishing is Alaska's largest industry, Secretary Udall commented, and the American public can help boost Alaska's economic recovery from the March 27 earthquake by serving more canned salmon.

The nationwide campaign was geared to reach its peak during May, June, and July. Although record stocks of canned pink salmon are available, industry spokesmen are confident that the inventories can be substantially reduced because canned salmon fits so well in warm weather menus.

**plentiful foods**  
A MONTHLY MERCHANDISING GUIDE FOR FOOD DISTRIBUTORS

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**Beef • Early Summer Vegetables •**  
**Canned Pink Salmon**

PP - 100 PAGES MAY 1964

USDA - AND - Food Distribution Division . 536 South Clark St., Chicago, Ill.

• CANNED PINK SALMON
• MEAT PRODUCTS
• DAIRY PRODUCTS
• FRESH VEGETABLES
• OTHER PLENTIFULS

With a supply of this versatile canned food on their shelves, housewives can provide their families with a variety of appetizing and quick and easy to prepare summer meals. In addition, they will find that canned pink salmon is an economical, no-waste, high-protein food that is an excellent source of vitamins, minerals and other nutrients. Budget-minded housewives will find that loaves, croquettes, and casserole dishes prepared from canned pink salmon are extremely practical, and tasty.

Secretary Udall said the Bureau of Commercial Fisheries will give special emphasis to canned pink salmon in its contacts with consumer groups, schools, other institutions, and the food trade associations. Special materials also are being prepared for distribution to newspapers and television and radio stations to provide maximum consumer attention to the availability of this convenient canned fishery product.

The U. S. Department of Agriculture also is cooperating in this promotional program,

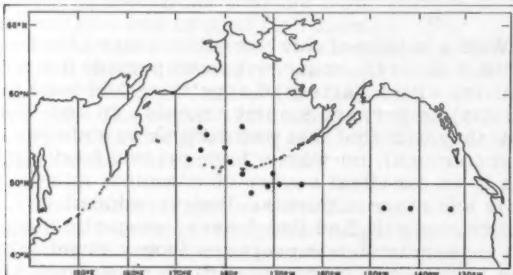
and canned pink salmon was listed in their June "List of Foods in Plentiful Supply." That Department also distributed specially designed merchandising tips to the retail grocery trade with the recommendation that increased merchandising attention be given canned pink salmon at the local level.

Note: Many attractive recipes are available to the homemaker in the Interior Department's full color 16-page recipe booklet, "Take a Can of Salmon," Fish and Wildlife Service Circular 60. As part of its contribution to this promotional campaign, the Canned Salmon Institute, Box 1200, Seattle, Wash., has supplies of this recipe booklet and will send a complimentary copy to interested homemakers. They are also available from the Superintendent of Documents, Washington, D. C. 20402, for 25 cents a copy, with a discount of 25 percent on individual orders of 100 copies or more.

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#### NORTH PACIFIC WINTER DISTRIBUTION AND TAGGING:

M/V "George B. Kelez" Winter 1964 Cruise (January 17-March 18, 1964): To further delineate the winter distribution of salmon in the North Pacific Ocean and Bering Sea, tag individuals to determine migration routes and area of origin, and to compare the catch rates and selection properties of gill nets and floating longlines were the principal objectives of this three-months cruise by the U. S. Bureau of Commercial Fisheries research vessel George B. Kelez.



Fishing stations completed by the M/V George B. Kelez during the 1964 winter cruise, January 17-March 18, 1964.

Unusually severe weather conditions over the entire Aleutian region and ice limits further south than anticipated permitted only 16 fishing stations and necessitated modification of the planned cruise track.

Salmonids were taken at every station but in comparatively low numbers. With the exception of one chum salmon and a few pinks and steelhead at the easternmost three stations, the catches were exclusively sockeyes, 90 percent of which were large and possibly maturing.

Gill nets and long lines were fished simultaneously only twice and catches in both types of gear were too small for statistical comparison.

The total number of fish caught and tagged during the cruise were:

Species	Caught	Tagged
	... (Number of Fish) ...	
<u>Salmon:</u>		
Sockeye . . . . .	263	134
Chum . . . . .	1	0
Pink . . . . .	24	21
Steelhead . . . . .	18	15
Total . . . . .	306	170

At the termination of this cruise, the George B. Kelez returned to Seattle to be outfitted for an oceanography cruise scheduled for April 1964.

Note: See Commercial Fisheries Review, August 1963 p. 6.

\* \* \* \* \*

#### NORTH PACIFIC HIGH-SEAS TAGGING PROJECT:

From 4 to 5 months of high-seas salmon tagging is to be undertaken by two purse seiners chartered by the U. S. Bureau of Commercial Fisheries, according to an April 1964 announcement by the Bureau's North Pacific Regional Office at Seattle, Wash. The vessels are the Commander and the Storm.

The areas to be covered will be (1) Central Gulf of Alaska; (2) Central Aleutians; (3) North-Central Gulf of Alaska; and (4) Coastal area of Northeast Gulf of Alaska. As part of the studies of salmon migration at sea, the Bureau's scientists aboard the vessels plan to experiment with sonic tags as a means of following the movements of individual salmon for 24 to 48 hours after tagging. This experiment will be conducted in connection with the vessel Storm in the area south of the Central Aleutians where the abundance of salmon is usually high and salmon movements are apparently directional.

The tag and hydrophone "sniffer" used will be of the type developed by the Bureau's Fish Passage Program. Of interest will be the rate of travel of the salmon, direction of movements, and reactions to tide changes and darkness. It is possible the fish will "mill" for some time due to the effects of tagging. Small boats from the Storm will be used to track the sonic-tagged salmon. The tests will be repeated as often as practicable.



## South Atlantic Exploratory Fishery Program

### EXPLORATORY TRAWLING OFF NORTH AND SOUTH CAROLINA CONTINUED:

**M/V "Silver Bay" Cruise 56 (March 30-April 20, 1964):** To conduct basic and seasonal trawling surveys off Long, Onslow, and Raleigh Bays was the main objective of this 22-day cruise off North Carolina and South Carolina by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. A total of 88 exploratory fishing stations was occupied between 5 and 100 fathoms. Exploratory gear consisted primarily of 50/70-foot, nylon, roller-rigged fish trawls fished on 8-foot bracket doors with 15-foot leg lines. The trawl nets were  $4\frac{1}{2}$ -inch mesh with cod ends of  $1\frac{1}{2}$ -inch mesh.

**LONG BAY:** In Long Bay, 36 trawling stations were occupied. In depths of less than 20 fathoms, catches were dominated by small numbers of scup (*Stenotomus* sp.), sea robins (*Prionotus* sp.), and miscellaneous sharks and rays. In 20 to 25 fathoms, all catches were dominated by filefish (*Stephanolepis hispidus*), which were taken in amounts up to 9,000 pounds per 90-minute drag. Snappers and grouper were taken at several locations between 26 and 40 fathoms. One area where dragging was productive is located at  $33^{\circ}11'$  N. latitude,  $77^{\circ}30'$  W. longitude in 29 fathoms. Two drags on this "lump" produced an average of 400 pounds of grouper, 300 pounds of gray triggerfish (*Balistes capriscus*), 90 pounds of snapper, 50 pounds of hogfish (*Lachnolaimus maximus*), and 20 pounds of white gorgy (*Calamus* sp.), for an average of 860 pounds of fish per drag. The grouper catches

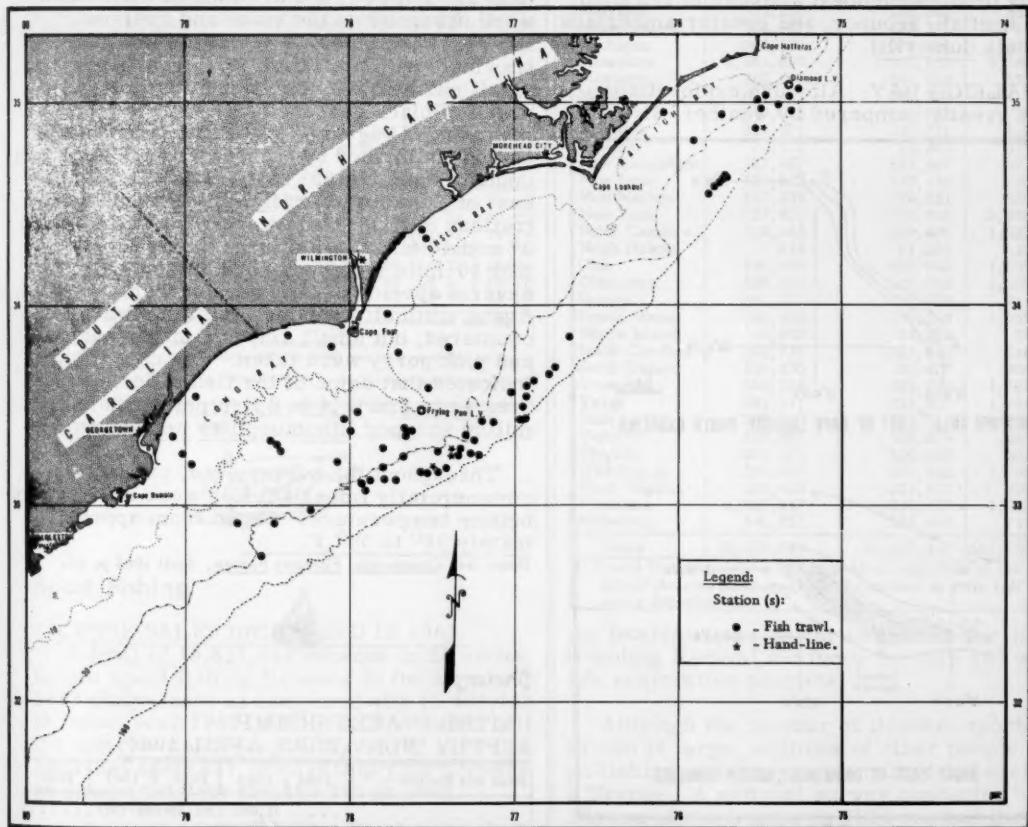


Fig. 1 - Shows the station pattern for Cruise 56 of the M/V Silver Bay, March 30-April 20, 1964.

consisted of gag (*Mycteroperca microlepis*), scamp (*M. phenax*), and red hind (*Epinephelus guttatus*). The snapper catches consisted of red snapper (*Lutjanus aya*), yelloweye snapper (*L. vivanus*), mutton snapper (*L. analis*), black fin snapper (*L. buccanella*), and yellowtail snapper (*Ocyurus chrysurus*).

**ONSLOW BAY:** In Onslow Bay, 31 stations were occupied for trawl or hand-line operations. Due to weather conditions, only the southwest portion of the bay was surveyed. In depths of less than 25 fathoms, the catches were generally unproductive and, again, were dominated by filefish. Heavy concentrations of fish were observed in 30 fathoms southeast of Frying Pan Light Ship  $33^{\circ}15' N.$  latitude,  $77^{\circ}22' W.$  longitude. Trawling was generally unsuccessful in that area due to rough bottom, but both trawling and hand-lining produced modest amounts of red snapper, hogfish, grouper, and greater amberjack (*Seriola dumerili*).

**RALEIGH BAY:** Although explorations were greatly hampered by weather, 21 sta-

tions were occupied in Raleigh Bay. Catches inside 25 fathoms were dominated by sharks, rays, and northern puffers (*Sphaeroides maculatus*). One drag east-southeast of Ocracoke Inlet in 17 fathoms produced 65 pounds of small (1 to 4 fish per pound) summer flounder (*Paralichthys dentatus*).

Extremely heavy concentrations of bottomfish were recorded at three locations in 30 to 40 fathoms near the edge of the Continental Shelf. The first of those areas consists of a small spot of broken bottom at  $34^{\circ}59.5' N.$  latitude,  $75^{\circ}24' W.$  longitude in 37 fathoms where the only drag made resulted in a damaged trawl. The catch consisted of 35 pounds of medium-size black sea bass (*Centropristes striatulus*). The second area is a ridge, 4 miles in length, which shoals to 30 fathoms from a depth of 37 fathoms due east of Drum Inlet (fig. 2). Heavy concentrations of bottomfish were observed on the sides and over most of the top of the ridge. The bottom was not trawlable with the exploratory gear used, but small catches taken by hand-line were composed of black sea-bass, red snapper, and pink porgy (*Pagrus*). The third area consists of a ridge formed by a sharp dropoff in bottom contour from the 35- to 40-fathom curve due east of Cape Lookout (fig. 2). Heavy concentrations of fish shoals were recorded between 37 and 40 fathoms along the entire length of that 10-mile ridge. Recordings indicate that several species of fish were probably present. Again, difficult trawling conditions were encountered, but small amounts of red snapper and pink porgy were taken. The catches also indicated that some of the fish schools in the area were small (4 to 8 fish per pound) vermillion snapper (*Rhomboplites aurorubens*).

Throughout the survey area, catches of commercially important fish were made where bottom temperatures ranged from approximately  $56^{\circ}$  to  $59^{\circ}$  F.

Note: See *Commercial Fisheries Review*, April 1963 p. 25.



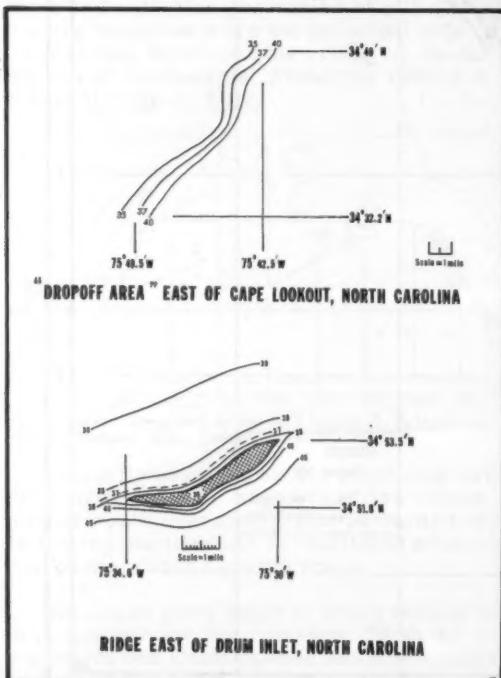
### Shrimp

#### UNITED STATES SHRIMP SUPPLY INDICATORS, APRIL 1964:

Item and Period	1964	1963	1962	1961	1960
..... (1,000 Lbs. Heads-Off) .....					
Total landings, So. Atl. and Gulf States:					
June .....	4,427	3,358	3,171	4,728	
May .....	10,152	6,186	5,276	6,335	

(Table continued on next page.)

Fig. 2 - Shows 2 locations off Raleigh Bay where heavy concentrations of bottomfish were located during Cruise 56 of the M/V *Silver Bay*.



Item and Period	1964	1963	1962	1961	1960
(1,000 Lbs. Heads-Off) . . . . .					
April . . . . .	4,800	4,427	3,358	3,171	4,728
March . . . . .	4,269	3,632	3,331	4,754	4,099
January-February . . . . .	10,409	7,979	7,963	9,596	9,186
January-December . . . . .	-	138,281	105,839	91,396	141,035
Quantity canned, Gulf States 1/:					
June . . . . .	-	5,234	4,913	3,438	6,920
May . . . . .	-	3,831	1,794	1,208	1,461
April . . . . .	-	105	12	9	66
March . . . . .	-	12	92	86	35
January-February . . . . .	634	750	733	273	470
January-December . . . . .	-	29,468	23,322	14,500	26,394
Frozen inventories (as of end of each mo.) 2/:					
June 30 . . . . .	-	24,047	13,796	19,416	15,338
May 31 . . . . .	-	24,053	13,904	24,696	17,540
April 30 . . . . .	-	24,954	15,637	27,492	20,502
March 31 . . . . .	31,476	27,970	16,607	31,345	23,232
February 29 . . . . .	35,303	28,039	19,012	37,612	29,063
January 31 . . . . .	43,752	28,487	21,328	37,842	34,332
January 1 . . . . .	45,335	31,577	19,755	40,913	37,866
Imports 3/:					
June . . . . .	-	9,439	9,397	8,065	8,932
May . . . . .	-	11,110	11,020	8,278	9,902
April . . . . .	-	11,082	10,210	9,208	7,733
March . . . . .	12,777	13,616	9,558	10,347	8,545
January-February . . . . .	24,962	25,239	23,506	21,270	16,253
January-December . . . . .	-	151,530	141,103	126,268	113,418
... (¢/lb., 26-30 Count, Heads-Off) . . . . .					
Ex-vessel price, all species, So. Atl. and Gulf Ports:					
June . . . . .	-	77.0	84.4	53.7	64.1
May . . . . .	-	80.9	83.7	52.8	62.9
April . . . . .	4/57-61	83.6	82.2	55.4	60.6
March . . . . .	4/57-61	85.5	80.9	56.0	56.3
February . . . . .	4/57-62	85.7	78.9	53.5	51.8
January . . . . .	4/57-69	85.0	76.3	52.5	49.5
Wholesale price, froz. brown (5-lb. pkg.), Chicago, Ill.:					
June . . . . .	-	95-102	102-104	67-72	76-77
May . . . . .	-	100-103	96-103	67-69	74-77
April . . . . .	72-74	100-105	94-97	69-70	74-75
March . . . . .	72-75	102-106	94-95	69-71	65-68
February . . . . .	73-82	102-106	93-95	69-71	65-67
January . . . . .	78-83	102-106	91-94	69-71	64-66

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.

2/Raw headless only; excludes breaded, peeled and deveined, etc.

3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.

4/Reported prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Tex., only.

Note: April 1964 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.



## Sport Fishing

### LICENSE SALES INCREASED IN 1963:

A total of 19,831,644 persons in 50 states bought sport fishing licenses in fiscal year 1963 (July-June) as compared with 19,403,465 in fiscal year 1962, the U. S. Department of the Interior announced on April 20, 1964. In 1963 they spent \$57,780,259 to buy the licenses as compared with \$54,163,163 in 1962.

The state game and fish departments provide license holder and sales information to

Summary of the Number of Paid Fishing License Holders, License Sales, and the Cost to Fishermen in the United States, July 1, 1962 to June 30, 1963.

State	Paid Fishing License Holders <sup>1/</sup>	Fishing Licenses, Tags, Permits, and Stamps Issued	Gross Cost to Fishermen
Alabama	393,635	393,635	\$ 832,589
Alaska	58,844	63,771	347,775
Arizona	226,947	311,605	889,020
Arkansas	435,956	435,956	1,185,150
California	1,611,639	3,823,431	6,839,903
Colorado	440,669	445,362	1,604,313
Connecticut	111,845	111,845	433,759
Delaware	9,644	10,761	27,821
Florida	496,923	517,251	1,098,353
Georgia	530,722	555,911	716,706
Hawaii	4,264	4,264	9,496
Idaho	279,070	321,641	1,292,639
Illinois	700,555	733,032	1,639,974
Indiana	726,447	731,721	1,018,597
Iowa	391,355	402,811	993,318
Kansas	273,155	273,607	834,265
Kentucky	320,994	333,160	977,724
Louisiana	218,537	220,335	271,443
Maine	220,859	222,663	799,923
Maryland	101,031	103,642	333,216
Massachusetts	193,567	182,271	751,807
Michigan	903,190	1,079,322	2,272,541
Minnesota	1,344,658	1,465,269	3,163,715
Mississippi	336,673	344,799	539,628
Missouri	654,142	950,392	2,471,016
Montana	249,032	249,032	775,339
Nebraska	218,801	249,721	528,991
Nevada	74,102	83,964	311,684
New Hampshire	127,467	127,467	473,289
New Jersey	139,589	218,134	782,014
New Mexico	147,338	150,231	550,016
New York	727,821	758,835	2,388,428
North Carolina	309,448	459,406	1,027,586
North Dakota	70,638	71,093	118,436
Ohio	820,583	820,965	1,885,305
Oklahoma	485,053	485,053	1,085,279
Oregon	482,317	731,053	1,718,891
Pennsylvania	585,156	585,156	1,955,818
Rhode Island	18,983	18,983	57,811
South Carolina	292,731	321,939	646,790
South Dakota	155,230	160,477	304,832
Tennessee	650,256	895,832	1,128,930
Texas	882,111	883,407	1,764,546
Utah	209,510	221,541	635,490
Vermont	108,822	109,979	262,909
Virginia	321,896	506,466	897,135
Washington	398,676	401,942	1,797,237
West Virginia	180,465	221,427	607,034
Wisconsin	1,049,447	1,049,447	4,019,513
Wyoming	140,851	156,440	712,265
<b>Totals</b>	<b>19,831,644</b>	<b>23,976,447</b>	<b>\$57,780,259</b>

1/A paid license holder is one individual regardless of the number of licenses purchased. Data certified by state fish and game departments.

the Interior Department as a basis for distributing Federal aid funds for fish and wildlife restoration projects.

Although the number of licensed sport fishermen is large, millions of other people also go fishing without being required to purchase a license. A national survey conducted by the Bureau of the Census in 1961 showed there were more than 25 million sport fishermen in the United States who participated substantially



Sport fishing in Montauk State Park, Mo., at the opening of trout season.

in fishing during 1960. Including the more casual participants, the number of fishermen undoubtedly was greater in 1963. In many states, minors are not required to purchase a fishing license, and only six states require a license to fish in salt water.

Some states require sportsmen to purchase separate licenses, stamps, permits, or tags to fish for different kinds of fish. For example, a special stamp is required in several states to fish for trout.



### Tuna

#### U. S. CANNED TUNA INDUSTRY PRESENTS AWARD TO INTERIOR DEPARTMENT FOR MARKETING ASSISTANCE:

The United States tuna canning industry presented an award, in the form of a scroll, to Secretary of the Interior Stewart L. Udall on May 5, 1964, for Interior's successful efforts in support of the tuna industry during the past year. In presenting the award, the President of the Tuna Research Foundation commended the Department of the Interior and its Bureau of Commercial Fisheries for "good will and practical support" in boosting tuna sales during 1963. He said the Department's support of the industry was "an inspiring demonstration of the partnership of Government and business" which added strength to the free enterprise system.

Secretary Udall said the Department of the Interior was very pleased to have worked

with the tuna canning industry. He praised the industry for having a "very fine product and very high standards" and said, "We are happy to have had a part in this program. We feel it is the type of relationship with industry that is most productive for our national economy."



Fig. 1 - From left to right, Under Secretary of the Interior James K. Carr, Bureau of Commercial Fisheries Director Donald L. McKerman, and Secretary of the Interior Stewart L. Udall accept United States tuna canning industry award from Jack Corby, President of the Tuna Research Foundation, Terminal Island, Calif.

In 1963, the Bureau of Commercial Fisheries conducted a nationwide promotional campaign for canned tuna which included the distribution of recipe leaflets, marketing bulletins, television slides, and news releases about the nutritional value of tuna. The Department of Agriculture also played an active role in the promotion by featuring canned tuna in its monthly List of Foods in Plentiful Supply.

## Easy Does It...with TUNA

**SUMMERTIME IS TUNA TIME**

Wooden fork, wooden spoon or a can — truly the chef's best friend. Always available, crowd-right and prepared so easily in so many sparkling ways. Versatile tuna goes with so many things — it flattens fruit — teams with greens — and coddles casseroles. Tuna sings in sandwiches, too! Terrific tuna easy and elegant, bright and light, at your fingertips everywhere.

**SPARKLING SALADS**

**Tuna Salad** ... Spread mayonnaise on a crisp lettuce leaf; add cubes of tuna and a few sliced radishes.

**Tuna Potato Salad** ... Send an old standby soaring to new flavor heights with a combination of cubes of tuna with your favorite potato salad.

**Tuna Lettuce** ... Try this combination with a generous portion of sliced tomato. Cover with a spicy French dressing and garnish with tomato wedges.

**Tuna Macaroni** ... Give added interest to a crisp cold salad by adding cubes of tuna to the macaroni.

**Marrowed Lettuce** ... For a delicious flavor accent, try adding cubes of tuna to your marrowed lettuce combination.

**Summer Spuds** ... As a variation on the ever popular mashed potato, add cubes of tuna for a wonderful flavor combination.




Fig. 2 - Portion of Special Fisheries Marketing Bulletin issued by the U. S. Bureau of Commercial Fisheries and the U. S. Department of Agriculture to promote tuna sales.

In addition to marketing assistance, the Bureau of Commercial Fisheries also assists the fishing industry through biological research, participation in international fishery commissions, loans and grants for vessel construction, and through fishing gear research and exploratory fishing.

Note: See Commercial Fisheries Review, August 1963 p. 54.



## United States Fisheries

### FISH STICKS AND PORTIONS PRODUCTION, 1963:

The United States production of fish sticks and portions during 1963 amounted to 173.9 million pounds valued at \$65.6 million--a gain of 15 percent in quantity and 13 percent in value as compared with 1962. Fish sticks totaled 79.3 million pounds in 1963--7.1 million pounds or 10 percent above 1962, and fish portions amounted to 94.6 million pounds--up 16.0 million pounds or 20 percent.

Table 1 - U.S. Production of Fish Sticks by Months and Type, 1963 1/

Month	Cooked	Uncooked	Total
(1,000 Lbs.) . . . .			
January . . . . .	7,213	341	7,554
February . . . . .	7,782	459	8,241
March . . . . .	7,688	365	8,053
April . . . . .	6,249	297	6,546
May . . . . .	5,369	381	5,750
June . . . . .	5,828	297	6,125
July . . . . .	4,489	381	4,870
August . . . . .	5,427	269	5,696
September . . . . .	5,336	529	5,865
October . . . . .	7,200	928	8,128
November . . . . .	6,026	445	6,471
December . . . . .	5,525	471	5,996
Total quantity 1963 1/ . . . . .	74,132	5,163	79,295
Total quantity 1962 . . . . .	66,801	5,416	72,217
(\$1,000) . . . . .			
Total value 1963 1/ . . . . .	29,732	1,855	31,587
Total value 1962 . . . . .	28,029	2,047	30,076

1/Preliminary.

Month	1963	1962	1961	1960
(1,000 Lbs.) . . . . .				
January . . . . .	7,554	6,082	6,091	5,511
February . . . . .	8,241	6,886	7,097	6,542
March . . . . .	8,053	7,658	7,233	7,844
April . . . . .	6,546	5,719	5,599	4,871
May . . . . .	5,750	5,643	5,129	3,707
June . . . . .	6,125	5,117	4,928	4,369
July . . . . .	4,870	3,740	3,575	3,691
August . . . . .	5,696	5,760	6,927	5,013
September . . . . .	5,865	6,582	5,206	5,424
October . . . . .	8,128	6,698	6,133	6,560
November . . . . .	6,471	6,305	6,288	6,281
December . . . . .	5,996	6,027	5,618	5,329
Total . . . . .	79,295	72,217	69,824	65,142

1/Preliminary.

Table 3 - U. S. Production of Fish Sticks by Areas, 1963 and 1962

Area	1963		1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . . . .	24	64,205	26	57,398
Inland & Gulf States . . . . .	7	8,316	6	8,331
Pacific Coast States . . . . .	12	6,774	10	6,488
Total . . . . .	43	79,295	42	72,217

1/Preliminary.

Table 4 - U.S. Production of Fish Portions by Months, 1963 1/

Month	Cooked	Breaded Uncooked	(1,000 Lbs.)	
			Total	Un- breaded
January . . . . .	1,416	6,563	7,979	194
February . . . . .	1,317	5,746	7,063	298
March . . . . .	1,406	7,107	8,513	322
April . . . . .	1,466	6,271	7,737	182
May . . . . .	1,769	5,246	7,015	278
June . . . . .	846	7,749	8,595	179
July . . . . .	830	3,482	4,312	212
August . . . . .	1,156	5,264	6,420	264
September . . . . .	1,846	7,475	9,321	300
October . . . . .	2,001	7,554	9,555	322
November . . . . .	1,448	6,398	7,846	290
December . . . . .	1,122	6,115	7,237	213
Tot. qty. 1963 1/ . . . . .	16,623	74,970	91,593	3,054
Tot. qty. 1962 . . . . .	14,007	62,290	76,297	2,381
(\$1,000) . . . . .				94,647
Tot. value 1963 1/ . . . . .	6,846	26,100	32,946	1,035
Tot. value 1962 . . . . .	5,999	21,257	27,256	833
(\$1,000) . . . . .				33,981

Table 5 - U. S. Production of Fish Portions by Areas, 1963 and 1962

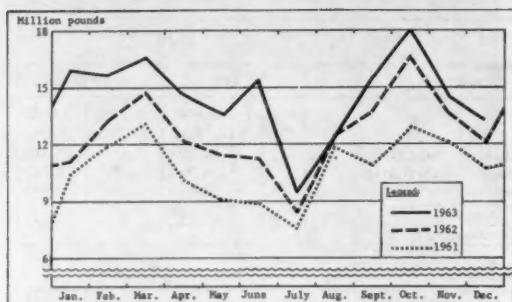
Area	1963		1962	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States . . . . .	27	53,211	26	44,072
Inland & Gulf States . . . . .	10	38,223	12	32,081
Pacific Coast States . . . . .	11	3,213	8	2,525
Total . . . . .	48	94,647	46	78,678

1/Preliminary.

Table 6 - U. S. Production of Fish Portions by Months, 1960-1963

Month	(1,000 Lbs.) . . . . .			
	1/1963	1962	1961	1960
January . . . . .	8,173	5,077	4,303	3,632
February . . . . .	7,361	6,360	4,902	3,502
March . . . . .	8,835	7,036	5,831	4,706
April . . . . .	7,919	6,408	4,484	3,482
May . . . . .	7,293	5,818	3,879	3,253
June . . . . .	8,774	6,137	4,039	3,995
July . . . . .	4,524	4,679	3,962	4,088
August . . . . .	6,684	6,687	4,963	3,558
September . . . . .	9,621	7,180	5,745	4,631
October . . . . .	9,877	9,871	6,759	5,275
November . . . . .	8,136	7,406	5,789	4,790
December . . . . .	7,450	6,019	5,191	4,459
Total . . . . .	94,647	78,678	59,847	49,381

Cooked fish sticks (74.1 million pounds) made up 93 percent of the 1963 fish stick total, while the remaining 5.2



U. S. production of fish sticks and portions, 1961-63.

million pounds or 7 percent consisted of raw fish sticks. A total of 91.6 million pounds of breaded fish portions (of which 75.0 million pounds were raw) and 3.0 million pounds of unbreaded portions were processed during 1963.

The Atlantic Coast was the principal area in the production of both fish sticks and fish portions with 64.2 and 53.2 million pounds, respectively. The inland and Gulf States were next with 8.3 million pounds of fish sticks and 38.2 million pounds of fish portions. The Pacific Coast States made up the remaining 10.0 million pounds of fish sticks and fish portions.



## U.S. Foreign Trade

### IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

United States imports of tuna canned in brine during January 1-May 2, 1964, amounted to 11,744,881 pounds (about 559,300 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the  $12\frac{1}{2}$ -percent rate of duty is limited to 60,911,870 pounds (or about 2,900,565 standard cases of 48 7-oz. cans). Any imports in excess of that quota will be dutiable at 25 percent ad valorem.

\* \* \* \* \*

### PROCESSED EDIBLE FISHERY PRODUCTS, MARCH 1964:

United States imports of processed edible fishery products in March 1964 were up 20.7 percent in quantity and 25.2 percent in value from those in the previous month. There was a seasonal increase in imports of groundfish fillets and blocks and slabs. Imports were also up for canned tuna in brine, canned sardines not in oil, and canned oysters.

Compared with the same month in 1963, imports in March 1964 were down 8.5 percent in quantity and 3.7 percent in value. Imports of canned sardines not in oil were much lower this March. Imports were also down for most other canned fishery products, except canned oysters. The decline was

partly offset by much heavier arrivals of groundfish fillets and blocks and slabs.

In the first 3 months of 1964, imports were up 2.6 percent in quantity and 7.2 percent in value from those in the same period of 1963. During January-March 1964 there were larger imports of groundfish fillets, flounder fillets, blocks and slabs, sea catfish fillets, yellow pike fillets, and canned sardines in oil, but imports were down for swordfish fillets, canned sardines not in oil, canned tuna in brine, and canned crab meat.

### U. S. Imports and Exports of Processed Edible Fishery Products, March 1964 with Comparisons

Item	Quantity			Value		
	Mar. 1964	Jan.-Mar. 1964	1963	Mar. 1964	Jan.-Mar. 1964	1963
<i>Fish &amp; Shellfish:</i>						
Imports <sup>1/</sup>	43.1	47.1	128.0	124.7	12.9	13.4
Exports <sup>2/</sup>	2.5	3.1	11.9	11.0	1.0	1.2

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).

2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in March 1964 were down 50 percent in quantity and 54.5 percent in value from those in the previous month. In March, there was a decline in shipments of all leading canned fish export items, except canned sardines in oil.

Compared with the same month of the previous year, the exports in March 1964 were down 19.3 percent in quantity and 16.7 percent in value. A sharp drop in exports of canned salmon, canned sardines not in oil, and canned squid, was partly offset by larger shipments of canned sardines in oil, canned shrimp, and canned mackerel.

Processed fish and shellfish exports in the first 3 months of 1964 were up 8.2 percent in quantity and 14.6 percent in value from those in the same period of 1963. In January-March 1964 there were much larger shipments of canned mackerel and shipments of canned sardines in oil and canned shrimp were also higher, but exports of canned sardines not-in-oil and canned squid were down sharply.



## Washington

### SALMON PLANTING PROGRAM CONTINUES:

The Washington State Department of Fisheries has not stopped planting young salmon in streams that run through or border Indian reservations. Both the Indians and others will share in the future salmon harvest.

During April 1964, more than 3.5 million young chinook salmon were planted in the Nisqually, Puyallup, and Skokomish Rivers, and 315,000 fall chinook fingerlings were to be

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planted in the Nisqually in May 1964, along with a plant of 100,000 in the Puyallup. The 3 rivers will then have received the following chinook salmon plants in 1964: Nisqually - 931,831; main Skokomish and Purdy Creek tributary - 2,809,750; and Puyallup - 362,784 fish.

The Puyallup plants are small because last year very few salmon reached the Puyallup salmon hatchery due to unrestricted off-reservation Indian fishing on the spawning run of chinook salmon. (Washington State Department of Fisheries, May 1, 1964.)

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#### DOGFISH SHARK FOR HATCHERY FISH FEED:

A firm in Tacoma, Wash., plans to use the unpopular dogfish shark to make moist pellet food to feed desirable fish such as trout and salmon, the Director of the Washington State Fisheries Department announced May 1, 1964. The Tacoma firm has plans to process around 200 tons of dogfish each month into hatchery feed.

The moist pellet food was perfected by the Oregon Fish Commission and used successfully by the Washington State Department of Fisheries in rearing silver salmon. Tuna viscera has been the chief ingredient of the pellet, but experiments have been made using dogfish as the chief ingredient. Fish culturists say the dogfish pellet food can meet the high quality standards set by fisheries agencies for food used in rearing trout and salmon.

Permits have been granted two trawlers to fish for dogfish in Puget Sound south of Point Defiance. Both commercial and sports fishermen, it is believed, will support any efforts to thin out the dogfish population of Puget Sound. The Tacoma company will reduce some dogfish, over that needed for pellet food, for use as fertilizer. (Washington State Department of Fisheries, May 1, 1964.)



#### Wholesale Prices

##### EDIBLE FISH AND SHELLFISH, MAY 1964:

Wholesale prices for edible fishery products (fresh, frozen, and canned) in May 1964 moved upward for a number of the fresh and frozen items--principally halibut, salmon, and

shrimp. But the higher prices were offset to some extent by lower prices for several of the other fresh, frozen, and canned fishery products. The overall wholesale price index this May at 105.4 percent of the 1957-59 average was up 2.2 percent from April, but was down 9.1 percent from the same month a year earlier.

Higher prices prevailed this May for the first-of-the-season supplies of western fresh halibut (up 22.6 percent) and salmon (up 9.9 percent) at New York City, and also for Great Lakes fresh-water fish. Those were largely responsible for the 9.2-percent increase from April to May in the subgroup index for drawn, dressed, or whole finfish. In contrast, May prices were lower for ex-vessel large haddock (down 10.2 percent) at Boston, and those were lower than in May 1963 by 29.8 percent. Compared with May 1963, prices in the subgroup this May were lower for all items except salmon (up 0.2 percent), and the subgroup index was down 6.8 percent.

Higher prices from April to May for South Atlantic fresh shrimp (up 4.2 percent) at New York City were the direct cause of the 1.9-percent increase in the subgroup index for processed fresh fish and shellfish. Wholesale prices for fresh haddock fillets at Boston this May were down 4.9 percent from the previous month, and compared with May a year earlier they were lower by 25.3 percent. Compared with May 1963, the subgroup index this May was down 12.5 percent because prices for all items in the subgroup were down considerably.



Buyer examining fresh West Coast halibut at Fulton Fish Market, New York City.

The May 1964 subgroup index for processed frozen fish and shellfish at 94.7 percent of the 1957-59 average was unchanged from the previous month. From April to May, prices for frozen fillets in the subgroup were lower, but frozen shrimp prices at Chicago were higher (up 2.0 percent) and tended to cancel out any apparent drop in the May subgroup wholesale price index. As compared with May 1963, the subgroup index this May was down 16.9 percent--prices were sharply lower for shrimp, and substantially lower for fillets of ocean perch and flounder.

May 1964 prices for canned tuna (down 1.2 percent) were somewhat lower than in April, as were prices for canned Maine sardines (down 2.4 percent). As a result, the subgroup index was down 0.3 percent despite higher canned salmon prices (up 1.1 percent). Higher prices for canned pink salmon were the result of improved demand and partial clearance of stocks. The subgroup index this May was lower than the same month a year earlier by 2.6 percent. Prices for canned salmon and canned Maine sardines were lower than in May 1963, but canned tuna prices (up 2.2 percent) were higher.

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1</sup> / (\$)		Indexes (1957-59=100)			
			May 1964	Apr. 1964	May 1964	Apr. 1964	Mar. 1964	May 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					105.4	103.1	104.1	115.9
Fresh & Frozen Fishery Products:					107.4	103.7	105.5	122.4
Drawn, Dressed, or Whole Fish:					107.5	98.4	100.9	115.4
Haddock, Ige., offshore, drawn, fresh . . . . .	Boston	lb.	.08	.09	80.5	87.4	61.8	86.2
Halibut, West., 20/80 lbs., drsd., fresh or froz. .	New York	lb.	.34	.28	101.5	82.8	89.2	105.9
Salmon, king, ige., & med., drsd., fresh or froz. .	New York	lb.	.92	.83	127.8	116.3	114.2	127.5
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.62	.57	92.5	84.3	108.2	110.4
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.58	.43	94.2	69.6	114.7	108.1
Processed, Fresh (Fish & Shellfish):					117.2	115.0	116.1	133.9
Fillets, haddock, sml., skins on, 20-lb. tins . . .	Boston	lb.	.30	.31	71.6	75.3	77.7	95.9
Shrimp, ige. (26-30 count), headless, fresh . . .	New York	lb.	.99	.85	116.0	111.3	113.1	134.8
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.50	7.50	126.5	126.5	126.5	139.1
Processed, Frozen (Fish & Shellfish):					94.7	94.7	96.2	114.0
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.37	.37	92.5	93.8	98.9	98.9
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.36	.37	104.1	107.0	108.5	102.6
Ocean perch, ige., skins on 1-lb. pkg. . . . .	Boston	lb.	.30	.31	105.2	108.7	114.0	117.5
Shrimp, ige. (26-30 count), brown, 5-lb. pkg. .	Chicago	lb.	.75	.73	88.3	86.6	87.2	120.4
Canned Fishery Products:					102.2	102.5	102.2	104.9
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . .	Seattle	cs.	22.25	22.00	97.0	95.9	94.8	108.7
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.),								
48 cans/cs. . . . .	Los Angeles	cs.	11.50	11.63	102.1	103.3	103.3	99.9
Mackerel, jack, Calif., No. 1 tall (15 oz.),								
48 cans/cs. . . . .	Los Angeles	cs.	6.13	6.13	103.9	103.9	103.9	100.0
Sardines, Maine, keyless oil, 1/4 drawn								
(3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.86	9.09	113.7	116.5	118.2	116.2

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.  
 2/Replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.



#### RADIATION AND FOOD

Consumers are hearing more and more about foods treated with some form of "radiation" to preserve them, or to kill insects or insect eggs, or to prevent sprouting, or to accomplish some other purpose.

They have begun to ask the U. S. Food and Drug Administration (FDA) questions about such "irradiated" foods.

What are the advantages of irradiating foods? Proponents of the process claim that for some foods irradiation substantially extends the life of a product without refrigeration--an advantage more important at the present time for the armed services than for the general consumer public. But sponsors of the process view it as a development with important implications for the consumer.

The advantage of irradiation of wheat, of course, is that the radiation kills the insect life that would otherwise develop and destroy the wheat or render it unusable for food. ("FDA Memo for Consumers," U. S. Food and Drug Administration, February 19, 1964.)

# FOREIGN



## International

FOOD AND AGRICULTURE ORGANIZATION

### INDO-PACIFIC FISHERIES DEVELOPMENT SEMINAR:

In the Indo-Pacific region, fisheries are of great importance, especially from the standpoint of nutrition, and governments in the region attach special importance to increasing fish production and consumption. That dominant fact emerged from the 17-day seminar on fisheries development, planning, and administration held in Canberra, Australia, in February 1964.



Organized by the Food and Agriculture Organization (FAO) Indo-Pacific Fisheries Council, the seminar was attended by fisheries administrators from Australia, Ceylon, India, Japan, French Polynesia, Korea, Malaysia, Pakistan, Papua-New Guinea, the Philippines, Thailand, Hong Kong, American Samoa, Guam, New Zealand, Viet-nam, and the South Pacific Commission.

The three FAO fisheries experts attending were the Acting Chief, Economics Branch, Fisheries Division, FAO, Rome; the Chief Economist, Marine Resources Institute, FAO, Peru; and the Regional Officer for Asia and the Far East, FAO, Bangkok.

The seminar was officially opened by the Australian Minister for Primary Industry,

who outlined Australia's role in the world food program and referred to some of the problems being experienced by countries in the Indo-Pacific region.

An FAO representative, outlining the background and purpose of the seminar, said that the formulation of realistic fishery development programs had always been a difficult and complex matter due to uncertainties about natural resources and potential markets, and the heavy dependence of fisheries on developments in other sectors of the economy. Moreover, the nature of the fishing industry tended to isolate it from other economic activities, geographically, socially, and administratively, thus increasing the difficulty of coordinated planning and of providing the government services required for its development.

"More than ever before there is an outstanding need to clarify the objectives of fishery development and the importance of these in relation to each other; to examine the real opportunities for development represented by the natural resources and potential markets; to recognize the limits of the available resources of personnel, facilities, equipment and funds; and to review current and planned programs in the light of these fundamental considerations.

"At the present time, many governments in the region are giving special consideration to the need for improving their planning organization and administration in agriculture. In view of the importance of coordinating fishery programs with broader programs of agricultural development and industrialization, it would be desirable to give early consideration to the special problems of fisheries, so that fishery programs might also benefit from such measures," the FAO representative concluded.

Subjects discussed by the seminar included (1) survey and appraisal of fishing situations--the nature of fishery resources--supply, technological, and economic aspects; (2) objectives of government fishery policies; (3) role of government in fishery development--organi-

### International (Contd.):

zation of government services to fisheries industry, organization and management of resources research, organization and conduct of technological research, organization and conduct of economic research; and (4) other government fishery activities in the field of statistics, fish marketing, fishery cooperatives, fishery credit, and fisheries education and training. (*Australian Fisheries Newsletter*, March 1964.)

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### OUTBOARD MOTORS INCREASE FISHING EFFICIENCY OF TRADITIONAL CRAFT IN SIX COUNTRIES:

Experience gained in mechanizing traditional fishing craft in Ceylon is now helping other countries add outboard motors to small fishing vessels under a Food and Agriculture Organization (FAO) Freedom From Hunger Project.

Three years ago a 45-year old Ceylonese fisherman lived on the shores of the Bay of Bengal in a small house with walls of thatched palm and a roof of palm fronds. He and his wife and seven children were crowded in the small house, but it was all he could afford. Now he has moved into a modern bungalow with brick walls and a tile roof. His income is ten times higher than it was three years ago, his children are being educated, and he is branching out into other enterprises connected with fishing.

That story has been repeated many times--with individual variations--in Ceylon since 1951, under a government program to help fishermen change from their traditional crafts propelled by sail or oar to mechanized methods of fishing. For hundreds of years fishing boats in Ceylon have been either dugout canoes or log rafts called catamarans. They are laborious and limited in scope. They have to be paddled if there is no wind. Sometimes a squall comes up when a traditional fisherman is far offshore and, if he loses sight of land before lights come on at night in the villages, he may lose his life. Sometimes the wind fails and he has to paddle back to shore, arriving during the heat of the day with his catch spoiled. Even with the most strenuous effort, a fisherman in a sail-powered catamaran could never in a single night get out to the 6- or 8-fathom depths where the big fish are.

The solution to those problems has been an outboard motor. A Finnish naval architect sent to Ceylon in 1959 by FAO helped the Ceylonese Government set up a mechanization program for traditional fishing craft. Discussing their initial work, the Finnish expert said, "We were sure that outboard engines could be fitted to catamarans and work efficiently, although there had been difficulties with them previously. We had a few strokes of luck at the beginning--mainly in the form of people. One of those people was 'Nag'--as we came to call him. Another was a Ceylonese fisheries extension officer.... He caught on very quickly to the use of the outboards and helped greatly. We got two outboards from a Swedish firm and started testing them, fitted to Nag's big catamaran, on Nainativu Island, off the north coast. Normally the catamaran carries six nets. We borrowed 11 more from Nag's neighbors. With these and the motorized raft, with which he was able to go out to the deep waters, Nag's catch increased 10 times--to 130 lbs. per day compared with 13...."

Now 860 of Ceylon's traditional craft have been fitted with outboard motors, provided mainly through private business channels. In addition, about 1,200 inboard powered boats have been built.

The 360 rafts mechanized in 1962 are said to be responsible for an increase of 2,000 metric tons in Ceylon's catch for that year. (The total increase in the Ceylonese fisheries catch between 1961 and 1962 was about 10,000 tons, due to all improvements in fishing techniques and boats.) The country's total catch showed a steady increase from 39,000 tons in 1957 to 84,000 tons in 1962, according to Ceylonese fishery statistics.

The Ceylon project is similar to others now being carried out in 5 other countries, involving more than 500 engines, under FAO's Freedom from Hunger Campaign. The program began with an offer by a manufacturer of outboard motors to give FAO a large number of engines for use in worthwhile projects to demonstrate their value in fishing boats. So far the company has agreed to supply several hundred engines. Other private companies have also offered engines at very low prices, and money to help buy and install them is being supplied by a variety of donors.

The engines are being given to fishermen's cooperative associations. They are sold on easy terms to selected fishermen-members

**International (Contd.):**

of the cooperatives, and proceeds from revolving funds, which in turn will be used for ventures which will help the fishing communities.

An FAO representative said, "It is necessary to put each project on a commercial basis, so that the fisherman has a stake in it and therefore a strong incentive for repayment . . . we feel that if the fisherman is repaying to his own association it will encourage him because it is, in effect, his money."

Besides supplying and installing engines, the project will also provide repair kits and spare parts. An expert will study the type of motor and installation best suited to local boats and, if necessary, another expert will organize maintenance and training of mechanized assistants.

So far the following engines have been provided: 28 in Togo (for a 2-year project launched in November 1963); 10 in Zanzibar; 50 in Dahomey; 85 in the United Arab Republic; and 360 in East Pakistan.

The Finnish naval architect who pioneered the Ceylonese project has now surveyed 22 countries, and new projects are envisioned in a total of 13 countries, using 3,500 outboard motors. For India, for example, where there are an estimated 80,000 unmechanized fishing craft, a project involving 2,000 engines for a 3-year period is being planned. It was expected that the plan of operation for the Indian project would be signed in the spring of 1964, pending agreement on all details.

"There are two interesting aspects of the Freedom From Hunger Campaign (FFHC) outboard projects," the Finnish naval architect said. "First, results can be seen very quickly, and, second, because the mechanized rafts can be easily beached, the fishermen can continue to live in their homes and fish offshore from the beach as they have always done, but taking much bigger catches. There is no need for them to move to some far-off fishing harbour, which is the situation in many countries when mechanized fishing boats are introduced." (Food and Agriculture Organization of the United Nations, Rome, April 10, 1964.)

Note: See Commercial Fisheries Review, October 1962 p. 48.

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**SWEDEN HELPS PAKISTAN MECHANIZE SMALL FISHING CRAFT:**

Sweden's Agency for International Assistance has pledged US\$158,600 to equip 285 small fishing craft in East Pakistan with outboard motors during the next two years. The project, which is being carried out under the Food and Agriculture Organization's (FAO) Freedom From Hunger Campaign (FFHC), will be reviewed at the end of the second year and if everything has gone well Sweden will provide East Pakistani fishermen with an additional 315 outboard motors. This would raise Sweden's total contribution to \$291,000, some \$70,000 of it cash and the rest in 600 motors and spare parts valued at about \$370 each. The Pakistani Government counterpart contribution is \$201,123.

The project is now under way and is scheduled to run three years. Its aim is to improve earnings and standard of living of some 3,000 fishing families in 3 villages near Chittagong, and 2 in the Sundarban area. The outboard motors will be sold to the fishermen on easy terms through local fishing cooperatives. Repair kits will also be provided and a Swedish expert will instruct the fishermen in engine care.

Tests carried out by FAO in Ceylon and other countries show that, when coupled with modern gear, equipping local craft outboard engines increases fishermen's catches an average of 300 percent.

FAO has five outboard mechanization projects in operation under the Freedom From Hunger Campaign (FFHC)--in Dahomey, Togo, East Pakistan, the United Arab Republic, and Zanzibar. They involve a total of 773 engines. Nine similar programs involving above 2,000 more engines are planned for India, Chile, Dominican Republic, Haiti, Tanganyika, Brazil, Nyasaland, Northern Rhodesia, and Burundi.

Sweden has already contributed \$376,383 to FFHC. Swedish funds have helped to pay FFHC central campaign costs and are now being used to finance projects in Asia and Africa. In addition to its East Pakistan pledge, Sweden has also agreed to contribute an additional \$712,000 to finance a training center for women and girls in Tanganyika. The four-year Tanganyika project was launched earlier this year with an initial Swedish contribution of \$173,000.

**International (Contd.):**

Counting Sweden's contributions already paid and funds pledged for the future, the total Swedish commitment to the four-year old Freedom From Hunger Campaign now stands at \$1,379,383. (Food and Agriculture Organization, Rome, March 31, 1964.)

**INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES****SOVIET UNION RATIFIES PROTOCOL AMENDMENT CONCERNING HARP AND HOOD SEALS:**

On April 13, 1964, the Union of Soviet Socialist Republics deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries. The Protocol (done at Washington, D.C., July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. The Protocol is not in force. (Bulletin, U. S. Department of State, May 4, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

**INTERNATIONAL PACIFIC HALIBUT COMMISSION****SPECIAL MEETING HELD:**

The International Pacific Halibut Commission, which is responsible for the regulation of the halibut fishery of the Northern Pacific Ocean and Bering Sea on behalf of Canada and the United States, held a special meeting in Seattle, Wash., on June 4, 1964.

The purpose of the meeting was to examine recent developments in the Pacific halibut fishery, and particularly those in the Eastern Bering Sea where there has been a serious decline in the fishery.

At the meeting the Commission reviewed the situation with its investigational staff and conferred with invited representatives of the vessel owners, fishermen, and dealers from ports in Washington, British Columbia, and Alaska.

**NORTH PACIFIC FUR SEAL CONVENTION****JAPAN RATIFIES PROTOCOL AMENDING INTERIM CONVENTION ON CONSERVATION OF FUR SEALS:**

On April 10, 1964, Japan deposited ratification of a Protocol amending the Interim Convention on Conservation of the North Pacific Fur Seals. The Protocol (done at Wash-

ington, D.C., October 8, 1963) relates to the continuation of the Interim Convention for another six-year period and reflects the recommendations adopted by the North Pacific Fur Seal Commission on November 30, 1962. The Protocol entered into force on April 10, 1964. (Bulletin, U.S. Department of State, April 27, 1964.) Note: See Commercial Fisheries Review, April 1964 p. 48; December 1963 p. 52.

**NORTHWEST PACIFIC FISHERIES COMMISSION****SALMON AND CRAB FISHERIES NEGOTIATIONS CONCLUDED BETWEEN U.S.S.R. AND JAPAN:**

The eighth annual meeting of the Northwest Pacific Fisheries Commission (Japan-U.S.S.R.) closed on April 28, 1964, after 58 days of negotiations. The two nations signed notes of agreement covering fisheries regulations and crab and salmon catch quotas in the treaty area. The 1964 salmon catch quotas under the agreement were set at 110,000 metric tons for Japan (55,000 tons each for Areas A and B), and 65,000 metric tons for the Soviet Union; and 1964 king crab production quotas of 252,000 cases ( $\frac{1}{2}$ -lb. 48's) for Japan and 378,000 cases for the Soviet Union were established.

The Commission readopted the following regulations for the salmon fishery in convention waters:

**Convention Areas:**

- (a) Area A, including the Sea of Okhotsk and the Bering Sea, is described as waters bounded on the east and south by a line commencing at Cape Navarin; thence southeast to a point of intersection at  $55^{\circ}$  N. latitude,  $175^{\circ}$  W. longitude; thence south to  $45^{\circ}$  N. latitude; thence west to  $155^{\circ}$  E. longitude; thence southwest to Aku-Yuri Island, and the Sea of Japan north of  $45^{\circ}$  N. latitude.
- (b) Area B is described as all convention waters south of the southern boundary of Area A.

**Prohibited Fishing Areas:**

- (a) Sea of Japan and Sea of Okhotsk north of  $45^{\circ}$  N. latitude.
- (b) All waters north of  $45^{\circ}51'$  N. latitude bounded on the east and south by a line commencing at a point 20 miles southeast of Cape Olyutorskoe; thence to a point 20 miles southeast of Cape Govena; thence to a point 20 miles east of Cape Ozernoi; thence 20 miles east of Cape Africa; thence east at  $55^{\circ}$  N. latitude to a point at  $170^{\circ}$  E. longitude; thence south to  $53^{\circ}50'$  N. latitude; thence west to a point 20 miles southeast of Cape Shipunskii; thence southwest to  $160^{\circ}$  E. longitude; thence south to a point of intersection at  $45^{\circ}51'$  N. latitude; thence west to a point of intersection at  $151^{\circ}30'$  E. longitude.
- (c) Area north of the southern boundary line of Area A and west of  $151^{\circ}30'$  E. longitude.

**Fishing Seasons:**

- (a) Area A:
  - (1) Mothership fishery--May 15-August 10.
  - (2) Land-locked fishery--June 21-August 10.
- (b) Area B:

Drift net and long-line fishery--April 30-June 30.

**International (Contd.):****Catch Limit on Catcher Boat and Survey Vessel:**

- (a) Catch limit on catcher boats not to exceed 300 metric tons.
- (b) Catch limit on survey vessels not to exceed 150 metric tons.

Total catch of catcher boats and survey vessels attached to one mothership shall not exceed total catch allocated to mothership. Should the catch of catcher boats and survey vessels fall within the amount allocated to each mothership, an increase in catch per catcher boat and survey vessel is permitted.

**Gear Regulations:**

- (a) Length of nets per boat:
  - (1) 10 kilometers (6.2 miles)--Sea of Okhotsk.
  - (2) 12 kilometers (7.5 miles)--In that portion of Area A within a line drawn from Cape Olyutorskoe at  $170^{\circ}25'$  E. longitude running south to  $48^{\circ}$  N. latitude, thence southwest to Aku-Yuri Island (Bulganin Line).
  - (3) 15 kilometers (9.3 miles)--all other areas.
- (b) Distance between nets set for fishing:
  - (1) Not less than 12 kilometers (7.5 miles)--Sea of Okhotsk.
  - (2) Not less than 10 kilometers (6.2 miles)--Pacific area within Bulganin Line.
  - (3) Not less than 8 kilometers (5.0 miles)--other areas.
  - (4) No distance limitation between nets operated by small boats fishing south of  $48^{\circ}$  N. latitude.
- (c) Size of mesh of gill nets:
  - (1) Gill nets operated by each catcher boat of mothership fleet in 1963 shall have a mesh size larger than 60 millimeters (2.36 inches) measured knot to knot; however, not less than 60 percent of gill nets fished by each boat shall have a mesh size larger than 65 millimeters (2.56 inches).
  - (2) Gill nets operated by land-based fleet in Area B shall have a mesh size not less than 55 millimeters (2.17 inches).
- (d) Long-line regulations:
  - (1) Diameter of branch lines used in long-line fishery in Area B (excluding Sea of Japan) shall be not less than 0.522 millimeters.
  - (2) Long-line fishing prohibited in Area A.

Japanese Government sources disclosed that Japan agreed to accept the Soviet proposal to delete from the Annex of the Japan-U.S.S.R. Fisheries Treaty the 10-percent catch allowance provided for Area B (south of  $45^{\circ}$  N. latitude), which allowed Japan to take up to 10 percent over the catch quota set for that area. Japan's acceptance of this proposal, however, was based on the condition that the Commission would insert in the agreement Japan's statement of view with respect to the 10-percent allowance, and

that the Commission would recognize this allowance for the 1964 fishing season.

The allowance was originally provided for Area B because of the difficulty of allocating separate catch quotas to the numerous small Japanese salmon vessels fishing in that area. Its elimination means that Japan can be accused of violating the Treaty even if her catches slightly exceed the area quota. Therefore, this concession is expected to place Japan in a disadvantageous position in future negotiations. In previous years, Japan had not been able to effectively regulate fishing in Area B. For example, in 1963 Japan had intended to limit the catch of the land-based long-line fleet to about 15,000 tons, but final landings figures showed that the total catch for the long-line fleet exceeded 20,000 tons.

The Japanese Government is now reported to be studying the method of allocating catch quotas to the domestic fisheries. The 1963 quota for Area A (57,000 tons) was divided on the basis of 81.21 percent for the mothership-type salmon fishery and 18.79 percent for the land-based gill-net fishery. However, inasmuch as the quota for Area B, which is fished exclusively by the land-based fleet, has been reduced by 8,000 tons this year and the 1964 quota for Area A has been reduced by only 2,000 tons as compared to 1963, the land-based fishery operators are expected to agitate for a bigger proportion of the Area A quota allotment. The 1962 catch quota for Area A was 55,000 tons, and for Area B 60,000 tons.

In Area B, the Japanese Fisheries Agency plans to allocate quotas by type of fishery (i.e., gill-net, long-line, etc.) and also plans to strengthen domestic regulatory measures to ensure full compliance with the Commission's regulations. In addition, the Agency hopes to develop a rapid reporting statistical system and a system of estimating catches of vessels at sea, so that when the quotas allotted to the different fisheries are about to be met, the Agency will be able to direct those vessels at sea to terminate their operations even before the season ends.

Concerning the 1964 negotiations, the Japanese Minister of Agriculture and Forestry stated that the quota agreement was a reasonable settlement considering the fact that 1964 is a poor pink salmon year. The president of a leading Japanese fishing company viewed the Soviet Union's modification of its original insistence upon a 48,000-ton quota for Area B as an unexpected concession. The president of the National Federation of Salmon Gill-Net Fishermen's Associations, however, expressed deep disappointment over the 55,000-ton quota for Area B, stating that the allocation of the quota, which should be determined on the basis of scientific analysis of resources, was instead established as a result of force meeting force, with Japan again being forced to retreat. (*Suisai Keizai Shim bun*, April 23, 25, & 29; *Nihon Keizai Shim bun*, April 24, 1964; and United States Embassy, Tokyo, May 4, 1964.) Note: See *Commercial Fisheries Review*, June 1963 p. 58; July 1962 p. 47.

**ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT****FISHERY TECHNOLOGISTS MEETING:**

The Organization for Economic Co-operation and Development (OECD) is organizing a meeting of fishery technologists at Scheveningen (The Hague) in the Netherlands, September 14-17, 1964.

The object of the meeting is to provide for a broad exchange of views between technologists from OECD Member Countries on the scientific work accomplished and the practical experience gained since their last meeting in 1956. Considerable progress has been made since 1956 in the techniques of handling, processing, and distributing fish and the OECD has felt the need to convene a further meeting of specialists in this field.

OECD expects that 150 participants from research centers and industry will attend the meeting. Technologists who wish to attend the meeting are asked to apply as soon as pos-

**International (Contd.):**

sible, either directly to the Fisheries Division of the OECD (2, rue Andre Pascal, Paris 16e, France), or through their country's Delegation to the OECD. Travel and accommodation expenses will be borne by participants.

The provisional program of the meeting lists the following topics:

September 14, 1964--First and Second Sessions:

**1. Storage of Fish in Chilled Sea Water at Sea (Biochemical and Engineering Aspects):**

- (a) Introductory paper on storage in chilled sea water.
- (b) Storing groundfish in refrigerated sea water.
- (c) Experiments with storage of herring and shrimp in chilled sea water.
- (d) Microbiological aspects of storage of fish in chilled sea water.

**2. Prepackaging of Fresh, Frozen, Smoked and Other Products for Retail Sale:**

- (a) Public health aspects of prepackaging.
- (b) Properties of packaging materials and their suitability for various products.
- (c) Technological application.
- (d) Practical experiences with prepacked fresh fish for retail market.

September 15--Third and Fourth Sessions:

**3. Handling of Wet Fish Aboard and on Shore (Except in Chilled Sea Water):**

- (a) General introduction.
- (b) Mechanization of German trawlers.
- (c) Development in United States.
- (d) Construction of trawlers in connection with handling of the catch.
- (e) Experience in Norway.

**4. Handling of Wet Fish Aboard and on Shore:**

- (a) Handling of fish in the auction hall and layout of the auction hall.
- (b) Experiences with plastic fish boxes in French harbors.
- (c) Hygienic aspects of fish boxes.
- (d) Handling and distribution of fresh fish.
- (e) Inland distribution of fresh fish.

September 16--Visits to be organized by the Dutch authorities, details of which will be sent with the definite agenda.

September 17--Fifth and Sixth Sessions:

**5. Problems in Freezing, Cold Storage and Thawing:**

- (a) General introduction about technical and economical aspects of freezing of fish at sea.
- (b) German experiences in freezing fish at sea.
- (c) Special problems with freezing of very fresh fish.

**6. Problems in Freezing, Cold Storage and Thawing:**

- (a) Time/temperature tolerance for frozen fish and fish products.
- (b) Thawing of frozen fish, mainly for further processing.
- (c) Thawing of frozen fish.

Each of the six sessions will be followed by a discussion period on the subject presented. (OECD Technical Information Bulletin, Paris, May 13, 1964.)

UNESCO INTERGOVERNMENTAL  
OCEANOGRAPHIC COMMISSION

**THIRD SESSION MEETS IN PARIS,  
JUNE 10-19, 1964:**

Interested countries have been invited to attend the Third Session of the Intergovernmental Oceanographic Commission (IOC) meeting in Paris, June 10-19, 1964. UNESCO, at its 11th session, adopted a resolution establishing the IOC "to promote scientific investigation with a view to learning more about the nature and resources of the oceans, through the concerted action of its members." IOC programs are carried out through cooperative action by Member States rather than by centralized action, and each Member determines if and to what degree he will participate in any program.

IOC has assumed the coordination of the International Indian Ocean Expedition (IOE), which was originally launched by the Scientific Committee on Oceanic Research (SCOR) of the International Council of Scientific Unions (ICSU). That program will continue through 1965. The first major program initiated by IOC was the International Cooperative Investigation of the Tropical Atlantic (ICITA), which is virtually completed. IOC has also sponsored a South Atlantic Cooperative Investigation (SACI), and is expected to approve a Cooperative Study of the Kuroshio (CSK) at the Third Session.

Other programs to be considered at the Third Session include the General Bathymetric Chart of the Oceans sponsored by the International Hydrographic Bureau (IHB), the International Biological Program (IBP) sponsored by ICSU, installation and maintenance of tide gauges, a tsunami (tidal wave) warning system in the Pacific, and programs which Members may propose at the Session.

The Third Session will also consider a General Scientific Framework for World Ocean Study (GSF), exchange of data and information, means by which the Commission can assist its Members in development of national oceanographic programs, and a Second International Oceanographic Congress tentatively scheduled for the spring of 1966 in Moscow.



**Argentina****FISHERIES TRENDS, 1963:**

Argentina's fishing industry reported a record production in 1963 and even better results are expected in 1964. Commercial fisheries landings in Argentina in 1963 consisted of 110,320 metric tons of salt-water fish and 11,988 tons of fresh-water fish for a total of 122,308 tons, or 32 percent more than the 92,326 tons landed in 1962.

Argentine fish meal production from salt-water fish in 1963 totaled 6,636 metric tons, which was more than double the 1962 production of 3,248 tons. Fish meal exports for the first 11 months of 1963 amounted to 3,211 metric tons, as compared with 1,584 tons exported in the full year 1962.

Increased production of fishery products in 1963 was aided by the expansion of the freezing and packing industry, especially with respect to the preparation of fillets for export (largely to the United States). The capacity of the fish meal plants at Mar del Plata was also increased and new foreign markets, mainly in Europe, have been found for the increasing fish meal production. Argentina's fish meal exports in the first 11 months of 1963 to West Germany alone totaled 2,267 metric tons, whereas in 1961, total fish meal exports amounted to only 260 tons.

Argentine officials are optimistic that 1964 will bring further development in the fishing industry. They believe that the constant increase in domestic beef prices will spur a significant rise in local consumption of fish. To increase the catch, they plan to add about 20 new fishing vessels to the existing deep-sea fleet of 40 vessels. They also look for expanded fish meal exports. Argentina's fish meal industry is reported to have an annual production capacity of 12,000 tons, so there is considerable unused capacity.

There is, however, a need for further investment in parts of the fishing industry. National and Provincial authorities are planning a development program for the fishing industry which would authorize 147.5 million pesos (about US\$1.1 million) in credits to renew plant and equipment, increase production, and improve the system of distribution and marketing. (United States Embassy, Buenos Aires, April 30, 1964.)

Note: See Commercial Fisheries Review, Dec. 1963 p. 54; Nov. 1963 p. 54; and Sept. 1963 p. 57.

**Australia****LICENSING AND IMPORT REGULATIONS AFFECTING FISHERIES:**

The Australian fisheries are subject to regulation by both the Commonwealth Government and by the Australian State Governments.

Licensing: Commonwealth and State or Territorial licenses are required to fish in Australian waters. Licenses are required for each crew member as well as for the vessel. Foreign fishing vessels may be licensed to fish in Australian waters, although no foreign vessels are so licensed at present, according to the Fisheries Division of the Commonwealth Department of Primary Industry.

Licenses are required of all Australian fishing vessels, regardless of where they fish. The Commonwealth has delegated its licensing authority to the States and Territories, and requires the possession of a local fishing license as a condition for the issuance of a Commonwealth license.

Restrictions on Landing Fish in Australia: Laws and regulations prohibit the landing of fish in Australia by foreign-registered fishing vessels without prior approval of the Commonwealth Minister for Primary Industry.

Restrictions on Importing Fishing Equipment: The Fisheries Division and the Department of Customs and Excise of the Commonwealth Government have stated that there are no restrictions, other than payment of applicable customs duties, on the importation of fishing equipment into Australia.

Providing suitably equivalent vessels of Australian manufacture are not "reasonably available," fishing vessels may be imported free of duty under "by-law," or at the British preferential rate (usually 7.5 percent ad valorem). Application for admission under "by-law" must be made to the Department of Customs and Excise.

Fishing vessels denied admission under those provisions may be admitted on payment of the following import duties:

	BPT	MFN
Vessels exceeding 500 tons (gross register)	Free	12.5
Other vessels . . . . .	32.5	55.0

**Australia (Contd.):**

Customs duties on other fishing equipment are:

	BPT	MFN
Floats for fishing nets	Free	7.5
Fish hooks . . . . .	Free	10.0
Fishing and rabbit nets and netting . . . . .	Free	7.5

**Other Fisheries Regulations:** Specific regulations governing the operation of various Australian fisheries are issued by the State Government concerned and by the Commonwealth Government. (United States Embassy, Canberra, April 24, 1964.)

Notes: (1) BPT = "British Preferential Tariff"--applies to goods of United Kingdom origin.

(2) MFN = "Most Favored Nation Rates"--goods of United States origin fall within this category.

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**DIRECT FISH LANDINGS BY FOREIGN VESSELS RESTRICTED:**

The Australian Government is said to have amended the tariff regulation restricting direct exports to Australia of fish taken by foreign fishing vessels, according to the Japanese Fisheries Agency. Direct export is defined as export of catches not landed in a foreign port prior to their entry into Australia for unloading or transshipment. Exports to Australia of fish transshipped from another foreign port are permitted, provided their entry has been approved and documented by the Australian Minister of Primary Industries.

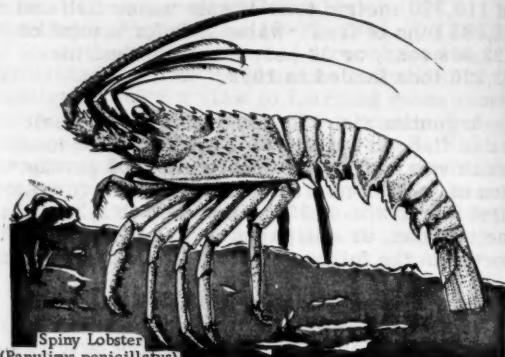
According to a survey made by the Japanese Fisheries Agency, Japan's 1963 direct exports by Japanese fishing vessels to Australia of frozen tuna (which form the bulk of frozen fish exports to that country) amounted in value to US\$5,781 for bluefin, \$6,694 for skipjack, and \$1,611 for albacore--a total of \$14,086. (Suisan Keizai Shimbun, May 2, 1964.)

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**SPINY LOBSTER TAGGING PROJECT:**

Spiny lobster tagging was carried out in the Abrolhos Islands area of Western Australia during January 22-February 12, 1964, by 2 teams from the West Australian State Fisheries Department.

About 7,000 spiny lobsters were tagged with a plastic dart tag inserted between the second and third tail segments. The tag has a barbed plastic shank to which is attached a spaghetti-like orange plastic tube bearing the letters F.D. and a serial number. The tag is  $3\frac{1}{2}$  inches long and the diameter of the tube



Spiny Lobster  
(*Panulirus penicillatus*)

one-twelfth of an inch. When the spiny lobster sheds its shell (moult), the barbed shank should hold the tag in the flesh so the new shell will grow around it. Some tags will be lost, of course, during the moulting process.

The purpose of the program is to obtain information on growth rates. Spiny lobsters only grow during a moult, so tagging was planned to take advantage of the general mature spiny lobster moult which takes place during February and March.

The spiny lobster commercial fishing season opened March 15, 1964, in the Abrolhos Island area. For the project to be successful, the cooperation of fishermen is required. Investigators need every tagged spiny lobster caught. (Australian Fisheries Newsletter, March 1964.)

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**TROUT FARM PLANNED IN TASMANIA:**

Australia's first fresh- and salt-water trout farm has been proposed for a site in Bridport, Tasmania. The Australian businessman sponsoring the project has engaged a Danish expert to help in the venture, and applied to the Tasmanian State Government for a license under legislation approved in 1963. Discussing his plans, the Australian businessman said, "Our target will also be the salmon

**Australia (Contd.):**

market. Australia imported about 8 million pounds of canned salmon from Japan and Canada in 1962, and we believe we can compete with the imported product, using rainbow trout. Ultimately it is hoped to produce fresh, frozen, and smoked fish for Australia and overseas." He said that later efforts might be made to build up a trade in trout eggs to supply fish farms in the United States and Europe.

An application has been made to the Tasmanian Government to use land on a mudflat adjacent to the Brid River for the trout-rearing station. Later it is hoped to develop another 50 acres of the Bar Marsh area near the Brid estuary.

Fresh water for the station would be drawn from the Brid River. As the station grows more water could be drawn from the Great Forrester River and nearby creeks. The initial plan is to reclaim the mudflat on the south side of the Brid River estuary for a series of fresh-water rearing ponds. The Bar Marsh section might become a fattening station where fish would be transferred when they were large enough to withstand sea water. However, the Bar Marsh would not be developed until more was known about the behavior of trout in salt and fresh water.

If early approval of the venture is received, a small number of trout might be harvested from the fish farm in 1965. (Australian Fisheries Newsletter, March 1964.)

**British West Indies****OUTLOOK FOR BARBADOS  
SHRIMP FISHERY PROMISING:**

By the end of 1963 it became evident that the actual potential of the newly established frozen shrimp enterprise in Barbados, operated by United States interests, had been underestimated by both the Barbados Government and the company management. Initially, the Barbados fishery company planned for a gradual increase in its United States-owned and operated trawler fleet of 25 vessels, and the Government had agreed to expand the inadequate cold-storage and freezing facilities of the Barbados Marketing Corporation to accommodate the shrimp landings anticipated.

Later, because the Government appeared reluctant to go along with the company's revised expansion plans, the company indicated that it would withdraw its base of operations. However, an agreement was finally reached and the company is now talking in terms of a 100-trawler fleet which would make Barbados one of the largest fishing fleet centers south of Tampa, Fla. If the plans for expansion develop, it is anticipated that 2 million pounds of frozen shrimp will be exported from Barbados within a 2- to 3-year period.

The year 1963 was summed up as a poor year for the local fishing industry in Barbados. The major problem to be overcome is the lack of capital for buying the equipment necessary which would permit fishermen to go beyond the shore line and engage in deep-sea fishing operations. (United States Consulate, Barbados, April 24, 1964.)

**Cambodia****COMMERCIAL FISHERIES  
PRODUCTION, 1960-1963:**

The commercial production of fishery products in Cambodia showed a general increase during the period 1960-1963.

Table 1 - Commercial Production of Fisheries Products in Cambodia, 1960-1963

Product	Unit	1963	1962	1961	1960
Fresh fish .	Metric Tons	31,390	24,006	20,034	25,858
Dried fish .	"	6,808	6,267	1,952	1,752
Smoked fish .	"	1,932	1,000	4/	5/
Shrimp .	"	109	164	83	45
Kapik <sup>1/</sup> .	"	66	62	41	46
Fresh crabs .	"	179	86	23	28
Salted crabs .	"	53	55	9	11
Prahok <sup>2/</sup> .	"	2,169	105	70	85
Tuk trey <sup>3/</sup> .	Hectoliters	4,527	3,117	3,126	3,799

1/Shrimp paste.  
 2/Fish paste.  
 3/Autolyzed fish liquid.  
 4/Production reported in "hand" units as 1.5 million "hands."  
 5/Production reported in "hand" units as 580,000 "hands."  
 Source: Cambodian Government Fisheries Source.

Statistics on fisheries production in Cambodia understate the total commercial catch, since a considerable part of the marine catch is delivered outside Cambodia. In addition, a substantial amount of the fresh-water fish catch by family or subsistence fishermen enters commercial channels without being recorded in official statistics (see table 2 on following page). (United States Embassy, Phnom Penh, April 24, 1964.)

## Cambodia (Contd.):

Table 2 - Major Species Which Comprise 90 Percent of the Commercial Catch

<b>Family: Cyprinidae (Carps):</b>
<u>Leptobarbus hoeveni</u> , <u>Danigila siamensis</u> , <u>Thynnichthys thynnoides</u> , <u>Osteochilus melanopleura</u> , <u>Osteochilus haseltii</u> , <u>Cirrhinus auratus</u> , <u>Labeo chrysophekadion</u> .
Catfishes of several families:
<u>Clarias batrachus</u> , <u>Wallaqo attu</u> , <u>Cryptopterus apogon</u> , <u>Pangasius</u> (3 species)
Other species from various families:
<u>Ophiocephalus</u> (several species), <u>Anabas testudineus</u> , <u>Pseudosciaena soldado</u> , <u>Oxyeleotris marmorata</u> .



## Republic of Cameroon

## CHINESE TUNA VESSELS TO TRAIN CAMEROON FISHERMEN:

Two Nationalist Chinese tuna fishing vessels arrived on the west African coast at Douala on April 4, 1964, to begin training work with Cameroon fishermen. The tuna fishing training program is for 18 months under an accord signed in September 1963 by the Republic of China and the Republic of Cameroon. Plans call for each Chinese crew to work intensively with a group of 3 trainees for a 4-months period.

The tuna vessels are the Chung Yu 501 and Chung Yu 502 (each 197 feet long with a net displacement of 600 metric tons and a hold capacity for 400 metric tons of frozen fish). The vessels are equipped for long-line fishing. On each vessel, refrigeration equipment can turn out 6 tons of ice a day and freeze 15 tons of fish an hour. After freezing, the catch will be stored in compartments at temperatures less than 20° F. Each vessel, with a crew of 30 seamen and 10 officers, carries such modern equipment as radar and sonar. A smaller vessel of 10 tons, carried by one of the larger tuna vessels, will be used for coastal fishing.

According to press sources, the tuna caught on the high seas will be sold either in Abidjan in the Ivory Coast, or Monrovia in Liberia. The port of Douala lacks the refrigeration and canning facilities which are available at Abidjan and Monrovia. (United States Embassy, Yaounde, April 10, 1964.)

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## Canada

## BRITISH COLUMBIA CANNED SALMON INDUSTRY ASKS FOR TARIFF REDUCTION AT 1964 GATT NEGOTIATIONS:

The Fisheries Association of British Columbia filed a statement March 16, 1964, with the Canadian Tariffs and Trade Committee concerning the scheduled 1964 trade negotiations in Geneva under the General Agreement on Tariffs and Trade. Pointing out that the salmon cannery industry of British Columbia is export oriented, the Association recommended that Canadian representatives make every effort to halt the upward movement of tariff rates on canned salmon in European countries. More favorable tariff conditions in the United States were also mentioned as objectives for Canadian negotiators.

The United Kingdom offers a duty-free market to Canadian canned salmon and absorbs most of British Columbia's export sales of canned sockeye salmon, but the Province's canned pink salmon pack has a much wider market. Until common tariffs began to be imposed in member nations of the European Economic Community, Canadian canned salmon enjoyed free entry into both Belgium and the Netherlands. Now both countries impose a 5.4 percent duty on Canadian canned salmon and Belgium adds an additional 6-percent internal tax. The highest consumer prices for canned salmon are found in France which imposes an import duty of 18 percent as well as the French consumers tax. That is said to be one of the reasons that France, with more than 5 times the population of Holland, purchases only slightly more canned salmon from Canada than the Dutch.

The Fisheries Association of British Columbia also discussed the export market situation in Australia and New Zealand. The Association has sent representatives twice in the last three years to appear before the Australian Tariff Commission. The Canadian salmon industry wishes to preserve the export market in Australia which permits unrestricted entry of Canadian canned salmon on the nominal duty basis of 1d. (1.17 U. S. cents) per pound.

In concluding, the Association's brief said "in return for any concessions made, concessions should be received which will have the effect of broadening the market area for our products or of reducing that part of the cost to our foreign customers which is represented

Canada (Contd.):

by import tariff rates." (Facts on Fish, April 9, 1964, Fisheries Association of B.C.)

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#### SMALL STERN-FISHING FACTORYSHIPS ORDERED BY NEWFOUNDLAND FIRM FROM DUTCH SHIPYARD:

In the fall of 1964, a Dutch shipyard is expected to deliver the first in a series of 4 small stern-fishing factoryships ordered by a Canadian fisheries firm in St. John's, Newfoundland. The main dimensions of the vessels will be: overall length 164 feet, beam 29.5 feet, and moulded depth 22.7 feet.

The factory trawlers have been designed so that their catch will be hauled aboard a stern chute. On a sheltered quarterdeck, the fish will be processed mechanically, and then stowed in refrigerated holds. Filleting machines, freezing equipment, and an ice-making machine will be located below deck.

The fish hold of each vessel will have a capacity of 14,120 cubic feet, and each vessel will be able to land about 280 tons of frozen fish or 320 tons of fresh iced fish. Each of the factoryships will have a crew of 20. (Commercial Fishing, March 1964.)

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#### NEW COMMITTEE FORMED FOR DEVELOPMENT OF FRESH-WATER FISHERIES:

A national program for the development of Canada's fresh-water fisheries was implemented early in May with the formation of a Federal-Provincial Prairie Fisheries Committee, announced the Canadian Department of Fisheries on May 12, 1964. Members of the new Committee are the Deputy Ministers of Federal and Provincial departments responsible for fisheries.

At a two-day organizational meeting, the committee, which is a result of the Federal-Provincial Conference on Fisheries Development held in Ottawa last January, adopted terms of reference, to be ratified by the governments concerned, and appointed subcommittees to make recommendations for industrial development and research. It received a progress report from a study group on marketing problems.

The Chief of the Fish and Wildlife Branch of the Ontario Department of Lands and Forests represented Ontario which was invited to send a representative to the meeting because the fisheries problems of its northern lakes are similar to those of the Prairie Provinces and the Northwest Territories.

The main purpose of the committee, which is similar in concept to the Federal-Provincial Atlantic Fisheries Committee, is to provide for the orderly and progressive development of a healthy and economic fisheries and to that end to coordinate, where practicable, the activities in the respective fields of responsibility of its members. The committee is expected to make recommendations to the respective governments for the implementation of fisheries programs and projects of common concern. These recommendations would include the development of methods and techniques in the catching of fish and of shore and plant facilities, and studies on the economics of fisheries to ensure that any proposed program of development is soundly based.

A second meeting, for reports on progress, is to be held at Winnipeg, Manitoba, in the fall of 1964.



#### **Chile**

##### FISH MEAL INDUSTRY TRENDS, FIRST QUARTER 1964:

After relatively good fishing during January and early February 1964, the fish reduction industry of northern Chile was again faced with a scarcity of raw material in March. Anchoveta, the commercial fish of the northern fish meal plants, disappeared off Arica February 20 and had not returned by mid-April. Off Iquique, anchoveta continued to be found in abundance until the second week of March 1964. Then, for almost a month, few Iquique vessels found sufficient fish to make their trip worthwhile until mid-April, when anchoveta reappeared within reach of the Iquique fleet.

The absence of anchoveta from northern coastal waters of Chile in late February and early March has been noted in former years and was not viewed with alarm by the industry. The prolonged absence this year was believed to be due to the unseasonably warm

**Chile (Contd.):**

weather through late March which may have moved the fish south out of reach of the northern fishing fleets. (Vessels taking anchoveta must be able to deliver their catch to the fish meal plants within a day or carry ice, which is not feasible.)

The Chilean Fisheries Development Institute, which became operative January 1, 1964, has leased a purse-seine vessel in order to speed up its study of anchoveta. (United States Embassy, Santiago, April 18, 1964.)

**Costa Rica****GREEN TURTLE REGULATIONS:**

The Department of Fish and Wildlife of the Costa Rican Ministry of Agriculture is drafting regulations to control the capture of green sea turtles (*Chelone mydas mydas*) during the months that they appear in large numbers off the Atlantic Coast of Costa Rica (July, August, September). The plan may provide for the establishment of a buying agency by the Consejo Nacional de Producción at Limón with agents at the Ports of Colorado, Tortuguero, and Parismina. The plan reportedly will authorize the Consejo to sell turtle meat at retail through its sales agencies and also wholesale the turtle meat to retail meat shops throughout Costa Rica.

The new regulations will implement Decree No. 9 of May 24, 1963, published in the Official Gazette of May 30, 1963. Following are the main provisions of Costa Rican Decree No. 9:

**Article (1)** Permits for the capture of green sea turtles shall be issued by the Ministry of Agriculture and Livestock.

**Article (2)** Permits for capturing green sea turtles shall be extended only for the period during which the turtles arrive at the Costa Rican coast--June, July, and August--and shall expire on August 31.

**Article (3)** The capture of green sea turtles for commercial purposes is prohibited on the beaches and for a distance of 1 kilometer (about 0.62 mile) inland, measuring from the high-tide mark.

**Article (4)** The unloading of captured green sea turtles shall be permitted only when the proportion of females does not exceed 50 percent of total lot.

**Article (5)** The concessionaire (permit holder) shall notify the appropriate fisheries authorities at Limón of the number of turtles captured during each voyage and the areas where they were taken.

**Article (6)** Live captured turtles can be kept in pens for a period not to exceed 15 days. Turtles which have been captured by harpoon must be slaughtered within 24 hours after unloading.

**Article (7)** The exportation of turtles shall be subject to the following conditions: (a) approval by the Ministry of Agriculture and Livestock on each export shipment of live or processed turtles; (b) approval by the Ministry of Agriculture and Livestock on each export shipment of turtle shells ("parazones") or other type of product; (c) the exportation of live turtles shall be authorized only after the national (local) demand for them has been satisfied; (d) applications for export permits shall be filed with Fish and Wildlife Office of the Ministry of Agriculture and Livestock, specifying the legal qualifications of the applicant, a description of the product to be exported, the destinations, and respective value.

Decree No. 9. was signed by the President of the Costa Rican Republic, May 24, 1963. (United States Embassy, Costa Rica, April 3, 1964.)

**Cuba****EQUIPMENT FOR NEW FISH CANNERY BUILT IN ESTONIA:**

Machinery and equipment for a fish cannery in Cuba is reported to have been built in the Estonian Socialist Soviet Republic. The plant, in the Havana Bay area, will have a daily capacity of about 4,500 pounds of finished product. Soviet technicians were to be sent to Cuba to help set up the equipment. (Unpublished source.)



## Denmark

### FISHERIES DEVELOPMENTS, APRIL 1964:

**Separate Fishery Negotiations Sought at GATT Sessions:** A proposal to seek separate negotiations on fishery products rather than have them included with agricultural commodities during the Kennedy Round at Geneva was discussed at the early April 1964 meeting of the Nordic contact committee on fishery problems. The proposal was made because it was feared that the difficulties involved in the agricultural negotiations would overwhelm the fishery discussions.

**Continued Dispensation on Undersized Whiting Requested:** Denmark plans to request a prolongation of the dispensation from the North Sea Convention which permits its fishermen in vessels with not over 150 hp, to use nets with less than the prescribed size mesh and to land whiting less than the minimum size of 23 centimeters (9 inches) in unlimited quantity if taken in prescribed areas of the Kattegat and Skagerrak. The dispensation originally expired May 1, 1963, but was extended for another year. The whiting catch is used mainly for pond trout food and mink food by Denmark's nearly 600 trout-pond operators and about 4,000 fur farmers. Some whiting is processed into fish meal. Danish biological studies show no adverse effects on the resource fished nor on the fishery for whiting for human food in other areas. Danish whiting landings for all purposes in 1963 amounted to about 55,000 metric tons, which is a new record.

**Processing and Distributing Plaice:** Packaged frozen plaice fillets are reported to cost the Copenhagen consumer 2 1/2 times as much as the fisherman received for the plaice from which they were processed, according to a Danish newspaper reporter and a fishery exporter. Their calculations were based on a package of frozen fillets selling at a Copenhagen supermarket for Kr. 3.95 (57.3 U.S. cents). The 8 fillets in the package weighed 450 grams (about one pound). On that basis, the retail cost of two fillets from one plaice was about Kr. 0.98 (14.4 cents).

In Danish retail fish stores, plaice usually are sold alive and filleted to order--an example of Danish insistence on quality. The frozen product is handled in other types of stores having the right to sell frozen foods. Such frozen food outlets may be tripled in 1966 if proposed legislation is approved.

**Fisheries Limits--Skagerrak:** Regulation of the fisheries and fisheries limits in the Skagerrak--the rich fishing area between Norway, Sweden, and Denmark--was an agenda item at the early April meeting of the Nordic contact committee on fishery problems. The discussion was in general terms and mainly exploratory with respect to the intentions of those three countries. No conclusions were reached, and no proposals are expected until there has been further study and another meeting.

Costs of Processing and Distributing Frozen Packaged Plaice Fillets in Denmark		
	kr/el	£
Cost of one plaice at auction . . . . .	41.0	5.9
Income from filleting waste sold for trout or fur-animal food . . . . .	-8.4	-1.2
Net cost of fish . . . . .	32.6	4.7
Direct labor . . . . .	14.0	2.0
Packaging . . . . .	3.3	.5
Depreciation and interest . . . . .	4.5	.7
Cost of processed fillets . . . . .	54.4	7.9
Processor's and wholesaler's profit--about 18% on wholesale price . . . . .	11.6	1.7
Wholesale price . . . . .	66.0	9.6
Retailer's profit--about 33% on retail price . . . . .	33.0	4.8
Retail price . . . . .	99.0	14.4

1/One Danish krone (100 øre) equals U. S. \$0.145.

The probable substantial increase in the Skagerrak herring fishery predicted for the coming winter and a number of years in the future by a noted Norwegian biologist has brought some urgency to the matter of fisheries limits and

rights in that area. Norway, Sweden, and Denmark naturally wish to preserve as much of the fishing area as possible for their own fishermen if the herring are to return as they have done in about 100-year cycles for a thousand years, according to predictions.

**Fisheries Limits--Denmark:** Extension of Denmark's fisheries limits to 12 miles, as provided in the agreement reached at the Western European Fisheries Conference in London in February, was expected would come with deliberate speed. Introduction of the necessary legislation in the Danish Parliament probably will be preceded by negotiations with West Germany and the Netherlands with respect to their fishing rights in Danish waters. Discussions of the proposed fisheries limits between Denmark's Fisheries Ministry and the Danish fisheries associations were reported to be just beginning about mid-April. (Regional Fisheries Attaché for Europe, United States Embassy, Copenhagen, April 22, 1964.)

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### FISHERIES TRENDS, JANUARY-MARCH 1964:

**Landings:** Denmark's fishery landings in January-March 1964 were down about 5 percent from the same period in 1963 because of stormy weather and less abundant industrial fish. The usual large Norway pout fishery--132,000 metric tons in 1962--dropped to 97,000 tons in 1963, presumably because of a poor year-class, but that fishery could recover in 1964. The common sole fishery, which declined about 80 percent in 1963 as compared with 1962 (because of the severe winter), is not expected to recover fully until 1966 or 1967. The North Sea herring fishery should give good yields in July and August of this year, according to Danish biologists. If the Norwegian herring follow a famous Norwegian biologist's predictions--as they seem to be doing--there should be a good herring fishery this coming winter in the inner Skagerrak and possibly on the Jutland banks in the North Sea. Unless the industrial fish catch improves, the current shift of cutters to fishing for foodfish could result in a somewhat smaller but more valuable total catch by Danish fishing vessels in 1964.

Since Denmark's fishery for undersized whiting, under a dispensation from the North Sea Convention, has not affected the whiting resources fished for either industrial or food uses according to their biologists, Denmark expects a renewal of the dispensation which expired May 1, 1964. Should this dispensation not be granted, the whiting fishery (55,000 metric tons in 1963) would be seriously curtailed.

**Exports:** Danish exporters of fishery products look forward to a favorable year for exports in 1964 if landings equal or surpass those of 1963. For the first quarter of 1964, total fishery exports were about 4 percent less in quantity but 12 percent greater in value than during the comparable period in 1963. Denmark's exports of fishery products to the United States in the first quarter of 1964 were down about 40 percent in quantity and value from the same period in 1963. Pond trout exports were about 65 percent less in value, cod exports were down about 50 percent, and canned herring and brisling exports dropped about 20 percent. Canned shrimp exports were about the same as the same period in 1963, but Norway lobster exports increased about 130 percent.

**New Developments:** A new development in 1964 has been the importing of fillet waste from the United States and Canada to supply food for Danish and Swedish fur animal (mink) farms. Prices f.o.b., Gloucester, Mass., at just under 2 cents a pound permit delivery in Denmark at about 3 1/4 cents a pound when shipped in large lots.

### Denmark (Contd.):

Because of the failure of the bluefin tuna fishery in Norway and Denmark last season, Japanese-caught big-eyed tuna were imported by Danish canners at \$350 a metric ton f.o.b. Italy. When trucked to Skagen the total cost was \$400 a ton. (Tuna producers in New England have been informed of Danish canners as a potential tuna market.)

United States Market: Lower prices in the United States market do not seem to be of especial concern. Alternate markets for cod fillets, for example, are being sought, and found, in England and on the Continent by Danish, Faroese, and Greenland producers. Pond trout sell as profitably in Europe as in the United States. However, the Danish Consulates General in New York, Los Angeles, and Chicago have reported to Danish processors that there is an increasing demand for Danish canned and frozen fish in those areas, and the Danish fisheries attache post in New York is to be filled.

Danish sardine canners cannot compete in the United States market with Maine canners for the less expensive canned sardine market when the Maine pack is normal, but Danish specialties, such as canned brisling in wine sauce, enjoy good United States markets. Currently, Danish canners are having difficulty competing with Canadian sardine canners on the world market. When possible, Danish canners try to market higher priced specialties. They pay about \$58 per metric ton to the fishermen for herring and about \$70 per ton for brisling. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, April 29, 1964.)

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### INDUSTRIAL PRODUCTS SUPPLY AND DISTRIBUTION, 1963:

Fish Meal: The Danish supply of fish meal in 1963 was only 1.5 percent less than in the previous year. Domestic production accounted for most of the supply, although Iceland shipped 8,706 metric tons of fish meal (more than half was herring) to Denmark in 1963, and Norway supplied 3,508 tons (somewhat less than half was herring). A small quantity (93.5 tons) was also received from the United States.

Distribution of the Danish fish meal supply in 1963 was about the same as in 1962. A mod-

Table 1 - Danish Fish Meal Supply and Distribution, 1962-1963

Item	Quantity	
	1963	1962
(1,000 Metric Tons)		
<b>Supply:</b>		
Stocks on hand January 1 . . . . .	3.6	4.0
Domestic production . . . . .	1/95.0	2/93.1
Imports . . . . .	12.3	15.5
Total supply . . . . .	110.9	112.6
<b>Distribution:</b>		
Domestic consumption . . . . .	47.3	52.5
Exports . . . . .	60.1	56.5
Stocks on hand December 31 . . . . .	3.5	3.6
1/Estimated.		
2/Revised.		

erate decline in domestic use for animal feed in 1963 was about offset by a gain in exports. The principal buyers of Danish fish meal (mostly herring) in 1963 were the United Kingdom with 31,255 tons, West Germany with 6,793 tons, Poland with 5,529 tons, Switzerland with 4,277 tons, Finland with 3,269 tons, Sweden with 2,809 tons, and the Netherlands with 2,023 tons.

Marine Oils: Refined oils from Peru made up a large part of Denmark's marine oil imports, although the imports in 1963 also included sizable shipments of crude marine oils from Peru. Danish production of hardened or refined marine and animal oils amounted to 25,000 tons in 1963 and 24,912 tons in 1962. Domestic production of crude fish oil (including herring oil)--the major factor in Danish production of crude--amounted to 25,000 tons in 1963 and 24,697 tons in 1962. Domestic production of other crude marine oils (whale, seal, and other) in Denmark amounted to 2,081 tons in 1962 (comparable data for 1963 is not yet available).

Table 2 - Danish Imports of Marine Oils, 1962-1963

Commodity and Country of Origin	Quantity	
	1963	1962
. . . (Metric Tons) . . .		
<u>Whale oil, crude:</u>		
Norway . . . . .	7.6	7.2
Netherlands . . . . .	0.2	-
Total . . . . .	7.8	7.2
<u>Sperm oil, crude:</u>		
Norway . . . . .	36.2	-
West Germany . . . . .	10.6	-
Total . . . . .	46.8	54.8
<u>Seal oil, crude:</u>		
Norway . . . . .	13.3	17.8
<u>Herring oil, crude:</u>		
United States . . . . .	1,221.8	-
West Germany . . . . .	-	1,214.3
Iceland . . . . .	1,223.4	507.0
Norway . . . . .	78.3	139.8
United Kingdom . . . . .	21.8	-
Total . . . . .	2,545.3	1,861.1
<u>Other marine oils, crude:</u>		
Peru . . . . .	3,449.3	-
Norway . . . . .	19.8	-
United Kingdom . . . . .	2.0	-
Total . . . . .	3,471.1	26.4
<u>Marine oils, refined:</u>		
Norway . . . . .	130.0	298.7
Peru . . . . .	15,326.6	17,271.4
Other countries . . . . .	12.3	38.8
Total . . . . .	15,468.9	17,608.9
<u>Marine oils and other animal oils, hardened:</u>		
Norway . . . . .	1,071.9	582.6
Sweden . . . . .	5,647.3	2,812.1
Other countries . . . . .	-	1.9
Total . . . . .	6,719.2	3,396.6

## Denmark (Contd.):

Table 3 - Danish Exports of Marine Oils, 1962-1963		
Commodity and Country of Destination	Quantity	
	1963	1962
	(Metric Tons) . . .	
<u>Whale oil, crude:</u>		
West Germany . . . . .	0.4	12.6
<u>Seal oil, crude:</u>		
Total all countries <sup>1/</sup> . . . . .	77.1	79.4
<u>Herring oil, crude:</u>		
Finland . . . . .	977.4	813.3
Norway . . . . .	972.2	4,299.1
Sweden . . . . .	683.3	1,508.3
Czechoslovakia . . . . .	1,194.4	434.8
Netherlands . . . . .	299.8	-
United Kingdom . . . . .	14,205.8	4,058.7
West Germany . . . . .	1,085.6	1,870.5
East Germany . . . . .		99.8
Total . . . . .	19,418.5	13,084.5
<u>Other marine oils, crude:</u>		
West Germany . . . . .	598.5	738.7
Czechoslovakia . . . . .	100.0	1,073.6
Other countries . . . . .	326.0	288.9
Total . . . . .	1,024.5	2,101.2
<u>Marine oils, refined:</u>		
Total all countries <sup>2/</sup> . . . . .	312.3	50.2
<u>Marine oils and other animal oils, hardened:</u>		
Colombia . . . . .	1,105.0	2,850.0
Other countries . . . . .	1,011.9	1,653.0
Total . . . . .	2,116.9	4,503.0

1/Mostly to West Germany, and some to Sweden.

2/Mostly to Norway and West Germany, and a small quantity to Sweden.

Crude herring oil accounted for the bulk of Danish exports of marine oils. (United States Embassy, Copenhagen, April 16, 1964.)

Note: See Commercial Fisheries Review, July 1963 p. 73.



## Ethiopia

NEW COMPANY WILL HANDLE  
FISHERY PRODUCTS:

Organization of an Ethiopian-Bulgarian company which will engage in shipping, fishing, and other activities was announced early in 1964. The capital of the company has been reported as Eth\$2 million (US\$800,000), of which one-fourth is paid up. It appears that 16,980 shares of the company's 20,000 registered shares are held by a Bulgarian Government organization.

The new company has registered four cargo ships under the Ethiopian flag to engage in general shipping between ports on the Red Sea, Mediterranean Sea, and Black Sea. The newly registered cargo vessels are under-

stood to have previously been the property of a Bulgarian organization, and the vessels will initially be manned by Bulgarian or other foreign crews. In the future, a training program for Ethiopian seaman may be arranged.

Four new 300-ton fishing vessels are to be acquired by the company. Each fishing vessel will have refrigeration equipment to store 120 metric tons of fish at 0° C. (32° F.).

The company will obtain fish both from its own fleet and from local fishermen. Edible fish will be frozen, presumably for the European market, and the remainder will be processed as fish meal. A freezing plant, fish meal plant and ice plant will be built near Massawa, Ethiopia, in an area north of the city. The freezing plant will have a minimum capacity of 30 tons a day and a maximum capacity of 80 tons. The capacity of the fish meal plant will be 60 tons of raw fish a day. The ice plant will be capable of producing 60 tons of ice a day. A pier will also be built. (Unpublished sources)



## German Federal Republic

FISHERIES RESEARCH VESSEL  
"WALther HERWIG" COMMISSIONED:

The Walther Herwig was commissioned as West Germany's second fisheries research vessel on October 28, 1963. Specifications of the vessel are: length overall 83.2 meters (272.9 feet), width 12.5 meters (41.0 feet), gross tonnage 1,987 tons, and net tonnage 889 tons. The vessel is powered by a 2,000 horsepower engine.

The Walther Herwig will operate in the Atlantic Ocean and will be used primarily for marine and fisheries research. The vessel began its first cruise November 25, 1963, when it sailed for the west coast of Greenland to carry out fisheries biological investigations. (International Commission for the Northwest Atlantic Fisheries Newsletter, No. 44.)



## Greece

FREEZER-TRAWLER LANDINGS,  
JANUARY-FEBRUARY 1964:

During February 1964, two Greek freezer trawlers and two refrigerator vessels landed

### Greece (Contd.):

992 tons of frozen fish at the port of Piraeus, down 36 percent from the same month a year earlier but 11 percent more than in February 1962. In January 1964, a total of 2,250 tons of frozen fish was landed by five freezer trawlers and one refrigerator vessel.

Total landings of frozen fish in January-February 1964 of 3,242 tons increased 11 percent from the 2,934 tons landed in the same period of 1963. (Alieia, March 1964.)

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### NEW EXPERIMENT TO USE FISH MEAL AS FISH FOOD:

The Government of Greece is starting an experiment--a new use for fish meal. If it is successful, a sizable new market for the product might be created. The experiment, to be carried out by the Greek Ministry of Industry's Department of Fisheries, is to import from Denmark 3 or 4 tons of fish meal which is to be used as fish food at 3 trout hatcheries in Greece.

Because Greece's Mediterranean waters no longer provide enough food fish and yields from the distant Atlantic Ocean fishing grounds are declining, the Greek Department of Fisheries hopes to help meet the demand for food fish with hatchery-reared fish, and possibly salt-water fish from estuaries.

The Director of the Greek Department of Fisheries cited the pioneer work done in Denmark in the use of fish meal as fish food. He said:

"In 1946 Denmark produced 400 tons of trout fed from fish meal, and in 1961 the total was 7,500 tons. The research workers there found that with fish meal they could grow a marketable fish in 18 months."

The three hatcheries in Greece include a state hatchery at Jannena, in northwestern Greece, a second under construction at Edessa in Macedonia, and a private hatchery near Laevadia, about 80 miles northwest of Athens.

The possible significance of the experiment to fish-meal producers would be in supplying the hundreds of state and private fish hatcheries scattered throughout Greece. Another possibility would be smaller sales of fish meal to farmers and others maintaining fish

ponds, either to supply their own tables or to provide fishing on a paying basis to others. Farmers are encouraged to dam streams and thus make small lakes which are stocked with fish.

The Department of Fisheries also plans to later try fish meal as a fish food on fish in the brackish waters of many estuaries of the seas almost surrounding Greece. About 100 of those are now being developed by the Government and exploited under concession by private firms and fishermen's cooperatives. The inlets being developed have narrow entrances which can be closed with a bamboo dike or weir in the spring and summer to admit water but prevent escape of the fish. The fish are now allowed to grow naturally in the inlets, but enrichment of their natural food supply with fish meal might well stimulate more growth. The hoped for results are larger fish and lower prices to the consumers.

A parallel experiment, said the head of the Department of Fisheries, may be in attempting to stimulate plankton growth in the estuaries by introduction of nutritious chemicals such as nitrogen and phosphates. Since fish feed on plankton, they would benefit from having a better natural food supply. He added, however, that feeding of fish meal will be more successful, if for no other reason than that it eliminates the intermediate step of feeding plankton. (Alieia, March 1964.)



### Iceland

#### FISHERY LANDINGS BY PRINCIPAL SPECIES, 1962-1963:

Species	Year	
	1963	1962
	... (Metric Tons) ...	
Cod . . . . .	235,201	223,449
Haddock . . . . .	51,215	54,276
Saithe . . . . .	14,321	13,469
Ling . . . . .	5,566	7,073
Wolfish (catfish) . . . . .	17,442	13,368
Cusk . . . . .	5,832	5,283
Ocean perch . . . . .	32,867	22,273
Halibut . . . . .	1,221	1,540
Herring . . . . .	395,166	478,127
Shrimp . . . . .	649	699
Capelin . . . . .	1,077	-
Lobster . . . . .	5,179	2,474
Other . . . . .	7,866	10,053
Total . . . . .	773,602	832,084

Note: Except for herring which are landed round, all fish are drawn weight.

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## Iceland (Contd.):

## FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-NOVEMBER 1963:

Species	January-November	
	1963	1962
	... (Metric Tons) . . .	
Cod . . . . .	226,508	217,968
Haddock . . . . .	46,850	50,351
Saithe . . . . .	13,722	12,585
Ling . . . . .	5,318	6,846
Wolfish (catfish) . . . . .	17,077	13,283
Cusk . . . . .	5,473	4,984
Ocean perch . . . . .	31,718	21,398
Halibut . . . . .	1,112	1,483
Herring . . . . .	384,879	424,569
Shrimp . . . . .	603	532
Capelin . . . . .	1,077	-
Lobster . . . . .	5,177	2,474
Other . . . . .	6,297	9,866
Total . . . . .	745,811	766,339

Note: Except for herring which are landed round, all fish are drawn weight.

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## EXPORTS OF FISHERY PRODUCTS, 1962-63:

During 1963, there was a considerable increase in exports of frozen and salted herring, herring meal, and cod-liver oil as compared with 1962, according to the Statistical

Product	Icelandic Fishery Exports, 1962-63		
	1963	1962	
Qty.	Value f.o.b.	Qty.	Value f.o.b.
Metric Tons	Kr.	Metric Tons	Kr.
Salted fish, dried . . . . .	2,420	53,958	1,252
Salted fish, uncured . . . . .	18,990	238,321	5,552
Salted fish fillets . . . . .	1,114	14,346	333
Wings, salted . . . . .	1,529	15,153	436
Stockfish . . . . .	9,610	21,650	6,456
Herring on ice . . . . .	7,311	32,510	548
Other fish on ice . . . . .	36,161	202,066	4,588
Herring, frozen . . . . .	37,384	208,497	4,837
Other frozen fish, whole . . . . .	3,952	41,102	954
Frozen fish fillets . . . . .	47,903	895,954	20,785
Shrimps and lobster, frozen . . . . .	1,138	96,823	2,246
Roe, frozen . . . . .	860	14,869	345
Cod liver oil . . . . .	340	16,310	378
Lumpfish roes, salted . . . . .	8,650	66,664	1,835
Other roes for food, salted . . . . .	3,180	44,981	1,044
Roe for bait, salted . . . . .	1,745	12,571	293
Herring, salted . . . . .	57,282	552,053	12,808
Herring oil . . . . .	55,148	301,357	6,991
Ocean perch oil . . . . .	754	5,130	119
Whale oil . . . . .	3,444	24,483	568
Fish meal . . . . .	22,809	116,689	3,720
Herring meal . . . . .	76,400	40,400	10,200
Ocean perch meal . . . . .	4,028	13,667	433
Wastes of fish, frozen . . . . .	4,779	13,181	308
Liver meal . . . . .	442	3,036	70
Lobster and shrimp meal . . . . .	267	693	16
Whale meal . . . . .	100	558	13
Whale meat, frozen . . . . .	2,447	17,138	398

Note: Values converted at rate of 1 krona equals 2.32 U. S. cents.

Bureau of Iceland's Statistical Bulletin, February 1964. Exports of frozen fish fillets and herring oil showed a decrease in 1963.

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## UTILIZATION OF FISHERY LANDINGS, 1962-1963:

How Utilized	Year	
	1963	1962
... (Metric Tons) . . .		
<b>Herring<sup>1/</sup> for:</b>		
Canning . . . . .	296	335
Oil and meal . . . . .	274,704	361,295
Freezing . . . . .	37,722	34,888
Salting . . . . .	76,642	69,621
Fresh on ice . . . . .	5,802	11,988
<b>Groundfish<sup>2/</sup> for:</b>		
Fresh on ice . . . . .	40,171	36,310
Freezing and filleting . . . . .	168,894	164,854
Salting . . . . .	71,566	88,135
Stockfish (dried unsalted) . . . . .	72,559	44,471
Canning . . . . .	47	-
Home consumption . . . . .	14,837	13,379
Oil and meal . . . . .	3,458	3,635
<b>Capelin for:</b>		
Freezing . . . . .	188	-
Oil and meal . . . . .	889	-
<b>Shrimp for:</b>		
Freezing . . . . .	507	561
Canning . . . . .	141	138
<b>Lobsters for:</b>		
Fresh on ice . . . . .	2	-
Freezing . . . . .	5,177	2,474
Total production . . . . .	773,602	832,084

<sup>1/</sup>Whole fish.

<sup>2/</sup>Drawn fish.

Source: *Aegir*, April 1, 1964.

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## UTILIZATION OF FISHERY LANDINGS, JANUARY-NOVEMBER 1963:

How Utilized	January-November	
	1963	1962
... (Metric Tons) . . .		
<b>Herring<sup>1/</sup> for:</b>		
Canning . . . . .	296	336
Oil and meal . . . . .	271,489	334,221
Freezing . . . . .	32,260	21,801
Salting . . . . .	73,955	59,283
Fresh on ice . . . . .	5,802	8,928
<b>Groundfish<sup>2/</sup> for:</b>		
Fresh on ice . . . . .	34,375	31,280
Freezing and filleting . . . . .	162,496	161,245
Salting . . . . .	70,527	86,921
Stockfish (dried unsalted) . . . . .	70,983	43,486
Canning . . . . .	47	-
Home consumption . . . . .	13,403	12,323
Oil and meal . . . . .	3,321	3,509
<b>Capelin for:</b>		
Freezing . . . . .	188	-
Oil and meal . . . . .	889	-
<b>Shrimp for:</b>		
Freezing . . . . .	475	446
Canning . . . . .	128	86
<b>Lobsters for:</b>		
Fresh on ice . . . . .	2	-
Freezing . . . . .	5,175	2,474
Total production . . . . .	745,811	766,339

<sup>1/</sup>Whole fish.

<sup>2/</sup>Drawn fish.

Source: *Aegir*, March 1964.

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Iceland (Contd.):

**TWO NEW FISHING VESSELS  
DELIVERED BY BRITISH SHIPYARD:**

The Jorundur II and an identical sister-ship, the Jorundur III, were delivered to Icelandic owners in March and April 1964 by a British shipyard in Selby. The dimensions of the new vessels are: length between perpendiculars 104 feet, length overall  $119\frac{1}{2}$  feet, moulded breadth 25 feet, moulded depth 12 feet, and gross tonnage 267 tons. Main power in both vessels is provided by an 800-horsepower Diesel engine. Both are equipped with variable pitch propellers.

Specifically designed for service in Icelandic waters, each vessel has a multipurpose fish deck which by its layout enables gear and fishing methods to be changed according to season. The vessels will probably operate as purse seiners in herring fisheries for 8 to 9 months out of the year, but they can also be used for trawling and long-lining.

The builder's description of the Jorundur II states, in part, "when trawling, the vessel employs fore and aft gallows on the starboard side, the aft unit of which is removed for purse-netting and long-lining operations. Twelve men are employed for trawling. Line fishing for cod requires a crew of 16 on Jorundur II--the extra numbers being engaged in hook-baiting... the line is paid out over a runner in the stern immediately beneath the boat deck.... .

"The bulwarks of the fish deck and the section boards of the fish pounds are 15 inches higher than normal for the better retention of the herring catch; a gravity chute is used for the rapid transfer of the herring from fish deck to hold."

The total fishroom capacity of the Jorundur II was reported to be 9,630 cubic feet. Cooling grids maintain a fishroom temperature of  $35^{\circ}$  to  $37^{\circ}$  F. Two liver tanks with a combined capacity of 1,500 gallons are fitted forward of the fishroom on port and starboard sides.

Both Jorundur II and III were built to Lloyds Class 100 A1 "Trawler" specification, and strengthened for navigation in ice. The vessels are of all-welded construction and were built by unit prefabrication methods. Their design embodies a bar keel, cruiser stern, raked round-nose stem of clipper form, and

flush deck with whaleback. Though conventional in type and mechanical layout, the vessels were equipped with modern navigational and fish-finding electronic equipment.



**India**

**INDO-NORWEGIAN FISHERIES**

**DEVELOPMENT PROJECTS CONTINUED:**

The Norwegian fisheries development project in India will be intensified during the fiscal year April 1, 1964-March 31, 1965. For work during that period, the Norwegian Government has provided an appropriation of Kr. 6.8 million (US\$952,000) and the Indian Government will also contribute substantial amounts. The basis for the cooperation is an agreement between India, Norway, and the United Nations concluded in 1952, and supplemented by later agreements in 1953, 1956, 1961, and 1963.

A chapter in the history of the Indo-Norwegian project was closed April 1, 1963, when Norwegian specialists withdrew from the villages of Sakthikulangara and Neendakara in the Province of Kerala where the project originally began. In that project area, a boatyard, engineering workshop, ice factory, and fish-freezing plant had been established.

The Norwegian specialists now plan to establish similar fishing stations at Cannanore in northern Kerala, Karwar in Mysore, and Madapam in Madras. It is estimated that construction of fishing facilities in those ports will be partially completed by the end of 1964.

The working program for the year also includes continued development of the fishery station in Cochin, Kerala, where the administration headquarters of the Indo-Norwegian fishery project is located. Plans also call for experimental fishing from the new stations. When the boatyards at the new fishing stations are put into operation, the training of local fishermen will begin.

A total of 26 Norwegian fishery specialists are now engaged in the fishery project in India. For most of the Norwegian positions, there are corresponding Indian positions, since the work will eventually be transferred entirely to Indian technicians.

The project is administrated by Indian authorities in consultation with the Norwegian

## India (Contd.):

project director. Until recently, the overall administration of the project was under the Provincial Government in Kerala, but it has now been transferred to the Central Government in New Delhi. (United States Embassy, Oslo, April 12, 1964, and News of Norway, May 23, 1964.)

Note: See Commercial Fisheries Review, July 1963 p. 78, and February 1962 p. 69.



## Japan

## FROZEN TUNA TO BE EXPORTED TO CUBA:

A Japanese fishing company is reported to have notified the Fisheries Agency of its intention to export to Cuba a total of 1,070 metric tons of frozen tuna between early May and early June 1964. Four tuna vessels were expected to deliver the frozen tuna to Cuba. They are the Akashi Maru, Sakiyoshi Maru No. 21, Zenko Maru, and the Sakiyoshi Maru No. 25. They were to carry 160, 270, 370, and 270 metric tons of tuna, respectively.

The firm is reported to have traded in tuna with Cuba since 1960. The trade was subsequently temporarily terminated due to problems involving payment. The existing agreement covering the 1,070-ton shipment is reported to have been concluded in December 1963. (Shin Suisan Shimbun Sokuho, May 7, 1964.)

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## EUROPEAN BIG-EYED TUNA MARKET REPORTED SOFT:

The European market for Japanese-caught frozen big-eyed tuna was reported to have softened considerably in late April and early May 1964. The price of big-eyed (which sold to Italy for around US\$340-360 a metric ton c.i.f. in February) declined to about \$300 a ton. Even at that price, Italian packers were said to be reluctant to purchase big-eyed, but one packer purchased a shipment for \$285 a ton c.i.f. Also, Yugoslavia and Czechoslovakia were not purchasing any big-eyed at that time.

The sluggish European big-eyed tuna market is creating a problem for the Japanese Atlantic tuna fishery. One press report states

that the catches of the Japanese tuna vessels (about 160) operating in the Atlantic Ocean are running 40-60 percent big-eyed. Japanese trading firms are said to be seeking big-eyed outlets in northern Europe, but they have not yet made any significant progress. They are also said to be studying the possibility of shipping big-eyed back to Japan, but since the transportation cost would run up to around \$63 a ton, they hope to dispose of their big-eyed tuna supply in Europe.

In an effort to overcome the depressed big-eyed tuna market in Europe, one Japanese trading firm is seeking an outlet for that species in West Germany. The Japanese firm's market survey indicated good possibilities of developing a tuna market in West Germany, not only for big-eyed but for other species of tuna in less than fair marketable condition. A report from the Japan External Trade Organization (JETRO) representative stationed in that country also indicates that West German fish packers, faced with a supply shortage, want to buy Japanese tuna, regardless of quality, provided the price is acceptable. The report stated that German packers hope to process the lower grade tuna into smoked fish for domestic consumption. (Suisancho Nippo, May 11 & 12; Suisan Tsushin, May 8, 1964.)

**Editor's note:** Previous reports indicate that as many as 120 Japanese tuna vessels have operated in the Atlantic Ocean at one time. The 160-vessel figure in this latest report, if accurate, is a new high.

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## JAPANESE NEGOTIATE TUNA PRICES WITH U. S. PACKERS IN AMERICAN SAMOA:

The Japanese fishermen's associations, fishing companies, and trading firms involved in the American Samoan tuna base operations were reported in mid-April to be negotiating tuna price agreements with the two United States packing firms in American Samoa. As of mid-April, Japanese-caught tuna delivered to American Samoa were quoted at highs of US\$260 a short ton for iced round yellowfin tuna and \$320 a short ton for iced round albacore.

The Japan c. & f. export price of frozen tuna delivered to the United States as of mid-April was \$375 per short ton for gilled-and-gutted yellowfin and \$400 per short ton for round albacore. (Suisancho Nippo, April 17, 1964, and other sources.)

\* \* \* \* \*

Japan (Contd.):

**JAPANESE FISHERY OFFICIAL'S VIEWS  
ON AMERICAN SAMOA TUNA BASE:**

An official of the Japanese Fisheries Agency who visited American Samoa earlier this year has given the following views of his visit to the tuna base there:

Japanese tuna vessels delivering tuna to the two United States plants located on American Samoa now total about 50. This is in sharp contrast to the time when a fleet of 70 Japanese vessels was delivering tuna to just 1 of the 2 plants.

In 1962, the average catch in tons per day was about 3 tons, but is now barely 1.5 tons. According to Japanese fishing captains operating vessels out of American Samoa, they could make out adequately if they could catch an average of two tons of tuna per day. (Suisancho Nippo, April 22, 1964.)

\* \* \* \* \*

**1964 TUNA MOTHERSHIP REGULATIONS  
FOR TWO FISHING COMPANIES  
CHANGED BY GOVERNMENT:**

The Japanese Government has notified two large Japanese fishing companies of changes made in the existing regulations governing tuna mothership fleet operations. The new regulations, applicable only for the 1964 fishing season, will affect their tuna mothership operations as follows:

1. The Yuyo Maru (5,040 gross tons) and Koyo Maru (7,500 gross tons) operated by one of the companies and licensed to fish with 55 and 45 catcher vessels, respectively, in the South Pacific Ocean off the Fiji Islands, must be accompanied by a catcher vessel fleet consisting of not less than 50 percent of the total number of catcher vessels authorized to accompany those motherships.

2. The Nojima Maru (8,800 gross tons) operated by the other fishing company and licensed to fish with 65 catcher vessels in the South Pacific Ocean off the Tahiti Islands, must be accompanied by a catcher vessel fleet consisting of not less than 60 percent of the total number of catcher vessels authorized to accompany that mothership.

3. For prevention of sea disasters, every catcher vessel must be equipped with wireless or radiotelephone so as to be able to

maintain close communication with its mothership or with other catcher vessels.

4. The Yuyo Maru and Koyo Maru fleets must operate within a radius of 1,000 miles from Suva, Fiji Islands. The Nojima Maru fleet must operate within a radius of 1,000 miles from Papeete, Tahiti Islands.

5. Catcher vessels must operate within close distance of their motherships.

6. Motherships must operate in areas where medical and other supplies, and repair services can be obtained readily from nearby bases (i.e., Suva and Papeete).

7. Fishing operations must be conducted in areas where ocean and weather conditions are relatively good.

The new tuna mothership regulations are viewed by the two fishing firms as imposing considerable difficulties on their operations. In previous years the Government had not stipulated the minimum fixed size of the mothership fleets, and the regulations requiring one company to contract not less than 50 percent, and the other company not less than 60 percent of the number of catcher vessels authorized to accompany their motherships are considered very difficult to comply with. (Suisancho Nippo, April 20, 1964.)

\* \* \* \* \*

**AGREEMENT SIGNED FOR JOINT TUNA  
VENTURE IN CAPE VERDE ISLANDS:**

The Japanese trading firm, which had been negotiating with a United States tuna packing firm and a Portuguese firm to establish a joint tuna base in the Cape Verde Islands, recently signed a formal partnership agreement with those firms to operate a joint base at Porto Grande, Sao Vicente Island. The base was to become operational in late May 1964.

Under the agreement, the Portuguese firm is to provide base facilities, which include a cold-storage plant; the Japanese firm is to supply fishing vessels; and the United States firm carrier vessels. Catches will be transshipped to the American firm's tuna plant in Puerto Rico and sold to the European and Japanese markets. The Japanese firm plans to contract three classes (190, 240, and 290 tons) of refrigerated long-line vessels from the Kanagawa Prefectural Tuna Fishermen's Co-

**Japan (Contd.):**

operative Association and hopes to have at least 10 of them operate regularly out of the Porto Grande base.

Base facilities presently include one 700-ton cold-storage plant, the capacity of which will be enlarged to 1,700 tons (an earlier press report cited the figure 3,000 tons) by November; one small fishing vessel repair shop operated by the Portuguese firm; and one warehouse, with another under construction.

The Portuguese Government approved the joint venture on the condition that the Japanese vessels do not fish within Portuguese territorial waters. In the past, the Portuguese Government, which has always viewed with disfavor Japanese fishing operations in the Atlantic Ocean, had refused to permit Japanese vessels to use the Cape Verde Islands as a base of operation. (Nihon Suisan Shim bun, April 24, 1964.)

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#### **COMPLETION OF JOINT JAPANESE-BRITISH FIJI ISLANDS TUNA BASE DELAYED:**

Construction of the joint Japanese-British tuna base at Levuka, Fiji Islands, originally scheduled to be completed in June 1964 was expected to be delayed for about one month due to problems on procurement of materials. Because of the delay the base will not become fully operational until August.

The Levuka tuna base is to be managed by a Japanese fisheries cooperative association, with cold-storage facilities to be operated by a joint Anglo-Japanese company. The base has an export quota of 9,000 short tons of tuna. (Suisancho Nippo, April 20, 1964; and other sources.)

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**JAPANESE SUMMER ALBACORE FISHERY:**

The 1964 Japanese summer albacore fishery, which began in late April 1964, reportedly continued slow as of early May. Indications were that fishing would get even poorer. Fishing conditions this year are reported to be entirely different from normal years, with the albacore schools distributed deeper below the surface of the Kuroshio current.

Some Japanese albacore fishing vessels were said to have switched to skipjack fishing, which was said to be relatively steady. Practically all the skipjack catches are being sold to the domestic fresh fish market at prices above 160 yen per kilogram (US\$403 a short ton). (Suisan Tsushin, May 4, 1964.)

\*\*\*\*\*

#### **TUNA PURSE-SEINING EXPERIMENT IN SOUTH PACIFIC UNSUCCESSFUL:**

The Japanese purse seiner Kenyo Maru (260 gross tons) spent two months at sea test-fishing for tuna northeast of New Zealand. The vessel (which is equipped with a power block) returned to Yokosuka on May 13, 1964, and reported very little success in its test-fishing experiment. The lack of success was attributed to unfamiliarity with the fishing grounds and to the lateness of the season. Fish schools located by that vessel by means of a fish-finder were at depths of 200-300 meters, so the vessel was not able to set its net on them. The vessel did not encounter any yellowfin or skipjack tuna.

The Japanese fishing company which operates the Kenyo Maru is reported to be planning on sending that vessel to the South Pacific again next year, only earlier in the season. (Shin Suisan Shimbun Sokuhō, May 7, 1964.)

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#### **TUNA MOTHERSHIP DEPARTS FOR TAHTIAN WATERS:**

The Japanese Nojima Maru (8,800 gross tons) tuna mothership fleet departed for the South Pacific waters off Tahiti on May 10, 1964, from Kobe. Although earlier reported to be encountering some difficulty in signing up catcher vessels, the fishing company operating that mothership succeeded in contracting for 65 catcher vessels (including 4 scout vessels) to deliver fish to its mothership. (Suisancho Nippo, May 9, 1964.)

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#### **TUNA-VESSEL REFUELING AT SEA TO CONTINUE:**

The Japan Federation of Tuna Fishermen's Associations (NIKKATSUREN) planned again to charter an oil tanker for refueling tuna vessels at sea, as it did in 1963. In addition to fuel, the tanker will carry fresh water and food for the tuna vessels receiving fuel.

## Japan (Contd.):

Later NIKKATSUREN chartered the 1,983-ton tanker Tofuku Maru to refuel tuna vessels at sea. The tanker was to have departed Yokohama for the eastern Pacific on May 13, 1964.

In 1963, NIKKATSUREN had chartered the 1,500-ton tanker Shimmei Maru. That tanker refueled 82 tuna long-line vessels at sea at a saving estimated to total three million yen (US\$8,333) a vessel. The savings resulted from elimination of running time to port to refuel and resultant increase in fishing time. (Suisan Keizai Shimbun, May 13, 1964, and other sources.)

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#### EXPORTS OF TUNA SPECIALTY PACKS, FY 1963:

Japanese tuna specialty packs exported in FY 1963 (April 1963-March 1964) totaled 438,875 cases, according to data compiled by the Japan Tuna Packers Association. This

Japanese Exports of Tuna Specialty Packs, FY 1963		
Product	FY 1963	FY 1962
.....(Actual Cases).....		
Tuna:		
With vegetable . . . . .	362,673	328,140
In jelly . . . . .	42,736	95,598
In tomato sauce . . . . .	17,976	14,163
Stew . . . . .	4,613	840
In specially seasoned sauce . . . . .	4,600	-
In curry sauce . . . . .	2,911	3,918
In soy sauce and oil . . . . .	1,640	1,170
Sandwich spread . . . . .	976	1,203
With sweet & sour pork	750	315
Total . . . . .	438,875	445,347

represents a slight decrease from FY 1962, when exports totaled slightly over 445,000 cases. (Suisan Tsushin, April 17, 1964.)

\* \* \* \* \*

#### TUNA DELEGATION TO U. S. BEING CONSIDERED:

Japan is seriously considering sending to the United States a tuna delegation representing trading firms and packers to survey the United States canned tuna market. The idea of the survey originated with the trading firms, and the packers are reported to be very much in favor of it. An executive session of the Japanese Packers Association was scheduled for April 27, 1964, to discuss the matter.

Reportedly, Japan felt that the stagnant condition of the canned tuna sales market in the United States was not a temporary one and may have long-range repercussions. Because of this, Japan felt that it should begin to study and develop measures to cope with the problem. (Suisancho Nippo, April 22, 1964.)

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#### CANNED TUNA MARKET TRENDS, APRIL-MAY 1964:

Japan offered for sale between December 1963 and March 1964, a total of 670,000 cases of canned tuna in brine for export to the United States. Of that amount only about 400,000 cases were said to have been sold. The Japan Canned Tuna Sales Company had about 1.1 million cases of canned white meat tuna in brine in stock, as compared with 570,000 cases at the end of the December 1962-November 1963 business year.

The drop in sales of Japanese canned tuna in the United States was attributed mainly to the loss of the competitive position of Japanese brands, resulting from the large promotional sales conducted by United States tuna packers. Japanese tuna in brine was reported to be selling at prices higher than name-brand American products packed in oil.

Japanese trading firms submitted to the packers a request to grant a promotional allowance of US\$1.00 a case for solid white-meat tuna, 50 cents a case for solid light meat tuna, \$1.50 a case for chunk white meat tuna, and \$1.00 a case for chunk light meat tuna.

At a meeting held on April 27, 1964, the packers deliberated on the proposal submitted by the exporters. However, due to conflicting reports submitted by the exporters and by the Japan Export Trade Promotion Organization (JETRO) on the canned tuna market situation in the United States, the packers requested the attendance of a representative from the exporters' association. That representative stated to the packers (in reference to the JETRO report) that it is not possible at all to analyze market trends on the basis of one or two reports, that the American products are, in fact, actually selling at prices lower than the Japanese products as had been reported by his group, and that the packers should send a survey party to the United States to study the market situation firsthand.

## Japan (Contd.):

Earlier, the packers were greatly in favor of the proposal submitted by the exporters to send a delegation to the United States to study canned tuna market trends, but they later were indifferent to the idea, although a segment of the packers' group still strongly favored doing so.

The packers had not arrived at any definite conclusion concerning the exporters' proposal to reduce prices and grant promotional allowances. They clearly recognize the need for placing Japanese canned tuna in a competitive position with the American products, but claimed that the promotional allowance requested by the exporters is excessive. As a result of the slump in sales, the canned tuna sale that had been scheduled for April was postponed until mid-May. (Suisan Tsushin, April 24, 27, & 28; Suisancho Nippo, April 23, 25, & 30, 1964.)

\*\*\*\*\*

**TUNA LONG-LINE EXPLORATORY CRUISE AIDS UNITED STATES SHARK STUDY:**

An observer from the United States Bureau of Commercial Fisheries boarded the Japanese research vessel Shoyo Maru at Panama on January 3, 1964, for a 2-months' cruise. The vessel was carrying out exploratory long-line fishing in the eastern tropical Pacific. From Panama, the vessel's cruise track ran to 10° S. latitude, 100° W. longitude. From there, 6 long-line stations were run to Manzanillo, Mexico, and from Mexico 8 stations were run to Honolulu, Hawaii.



The Japanese research vessel Shoyo Maru.

The Shoyo Maru, which does not carry commercial quantities of long-line gear, generally samples fringe areas not fished by Japanese commercial vessels. At the 14 stations between Panama and Hawaii, a total of 56 yellowfin tuna averaging 82 pounds each

were caught, along with 85 big-eyed tuna averaging 125 pounds each, and 98 spearfish averaging 72 pounds. Thirteen percent of the catch was damaged by shark bites and a total of 247 sharks representing 7 species were taken.

Frozen storage was provided on the Shoyo Maru so that 16 shark specimens could be preserved. On arrival at Honolulu, the shark specimens were shipped to California for taxonomic study in connection with work on a species list and key to all sharks found in the eastern Pacific.

Eyes of sharks, yellowfin, big-eyed, skipjack, little tuna, and frigate mackerel were preserved for a histological study of the retinas.

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**PRICES PAID FOR FIRST JAPANESE SALMON LANDINGS, MAY 1964:**

On May 7, 1964, the first significant landing (over 2 metric tons) of salmon (mostly chums) caught by a gill-net vessel was reported at the Japanese port of Hanasaki, Hokkaido. The fresh whole salmon sold (for the domestic trade) at the following prices:

Species	Price	
	Yen/Kg.	Cents/Lb.
Chum (A quality)	398	50
" (B quality)	358	45
Pink (A quality)	230	29
" (B quality)	190	24

In comparison, a year earlier on the same day (when market was somewhat stabilized due to large landings), A-quality fresh round chum sold for 325 yen a kilogram (US\$0.41 a lb.) and A-quality fresh round pink salmon 212 yen a kilogram (\$0.267 a lb.). (Hokkai Suisan, May 11, 1964.)

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**SALMON PRICES NEGOTIATED WITH VESSEL OWNERS:**

In April, the Japan Federation of Salmon Fishermen's Associations (NIKKEIREN) was negotiating 1964 salmon prices with the Japa-

Species	1964 Asking Price		1963 Price	
	Yen/Kg.	US\$/Lb.	Yen/Kg.	US\$/Lb.
Salmon:				
Red . . .	215	27.1	203	25.6
Chum . . .	130	16.4	110	13.9
Pink . . .	105	13.2	88.5	11.2
Silver . . .	144	18.2	120	15.2
King . . .	144	18.2	120	15.2

## Japan (Contd.):

nese companies operating salmon motherships. NIKKEIREN planned to ask for a 10 percent increase in salmon prices as shown in table.

The mothership companies, however, were planning to ask for a reduction of 10 percent from last year's salmon prices. (Suisan Tushin, April 22, 1964.)

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SALMON FISHERY QUOTA ALLOTMENT AND FLEET COMPOSITION:

The 1964 allocation of the 55,000-metric-ton salmon catch quotas for Areas A (north of 45° N. latitude) and B (south of 45° N. latitude) in the North Pacific was announced by the Japanese Fisheries Agency on May 9, 1964:

Area	Fishery	Catch Quota		Share of Quota
		Metric Tons	Percent	
A	Mothership-type fishery	44,665	81.21	
"	Land-based gill-net fishery	10,335	18.79	
	Total .....	55,000	100.00	
BB	Land-based gill-net fishery	33,240	60.44	
"	" long-line fishery	14,760	26.84	
"	" small-vessel fishery . . .	4,000	7.27	
"	Japan Sea gill-net fishery	3,000	5.45	
	Total .....	55,000	100.00	

The salmon mothership fleet for 1964 totals 11 motherships and 369 catcher vessels, the same as in 1963. The land-based gill-net fleet numbers 333 vessels. They consist of 293 vessels over 30 gross tons licensed by the Ministry of Agriculture and Forestry and 40 vessels over 5 tons but under 30 tons licensed by the prefectural government. The land-based long-line fleet consists of 369 vessels, 176 operating out of Japan proper and 193 based in Hokkaido. The small vessel salmon fleet consists of vessels under five gross tons and are estimated to total 1,200 vessels. Licenses are not required for their operation. The Japan Sea pink salmon gill-net fleet is restricted to 95 vessels in 1964. However, only 76 are reported to be actually engaged in fishing this year.

The salmon motherships were scheduled to depart for the fishing grounds on May 15 from Hokkaido ports. The fishery in Area B commenced on April 30 for vessels operating out of Japan proper and May 2 for vessels based in Hokkaido. The Japan Sea pink salmon

on fishery commenced in early spring. (Suisancho Nippo, May 1 & 11, 1964, and other sources.)

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SALMON NEGOTIATION WITH U.S.S.R. CONCLUDED:

On April 22, 1964, Japan and the Soviet Union informally agreed on the 1964 North Pacific salmon catch quota of 110,000 metric tons for Japan, the quota to be equally divided between Area A and Area B. This is the lowest catch quota established in eight years. Formal ratification of the agreement was scheduled for April 27.

On April 18, Japan and the Soviet Union reached an informal agreement on the following points:

1. Japan to autonomously regulate the catch of salmon in Area B according to type of fishery (e.g., long-line, gill-net) and to notify the Soviet Union of the estimated salmon catch of Japanese vessels operating in Area B.

2. Japan to voluntarily regulate the catch of red salmon in Area A, restricting the total catch to 7,750,000 fish. Of this quantity, Japan to limit the catch in the area west of 165° E. longitude and north of 48° N. latitude to 2.5 million fish.

3. Japan to operate two salmon motherships in the adjustment area north of the Kamandorskie Islands, as in 1963.

4. The Soviet Union to permit Japanese scientists to visit the Okhotsk Sea area and the northern West Kamchatka area. (Rafu Shimpo, April 25; Suisan Keizai Shimbun, April 21, 1964.)

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JAPANESE VIEW ON CANADIAN CANNED PINK SALMON MARKET TRENDS:

According to information from sources connected with Japanese trading firms, Canadian holdings of canned pink salmon have been reduced from 540,000 cases carried over from 1963 to 362,500 cases as of April 30, 1964. The reduction of inventory was attributed to improved market conditions in Canada. The quality of the canned pink salmon stocks in Canada at that time was said to be suitable for either domestic consumption or for export.

## Japan (Contd.):

The supply was expected to be exhausted by the end of June.

The increased production of canned pink salmon in Canada during the past three years is reported to have resulted in the development of a buyer's market. For 1964, however,



Japanese sources foresee a decline in Canadian pink salmon production, which may well lead to a seller's market. Therefore, Japanese traders, who foresee a good pink salmon export market this year, are reported to be hopeful of raising the export price of the 1964 pack substantially above the existing Japan f.o.b. price of \$10.30 a case. (Suisancho Nippo, May 4, 1964).

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#### BOTTOMFISH MOTHERSHIP OPERATIONS IN BERING SEA:

The Japanese mothership Soyo Maru (11,192 gross tons), accompanied by 28 trawlers, left Yokohama May 10, 1964, for the Eastern Bering Sea. The mothership Itsukushima Maru (5,871 gross tons), accompanied by 12 trawlers and six long-line vessels, was scheduled to leave Hakodate May 19. Three Japanese mothership fleets were on their way to the Eastern Bering Sea fishing grounds in early May: the stern trawler Taiyo Maru No. 82 (2,890 gross tons), accompanied by one small side trawler, left Hakodate May 1; the Seifu Maru (8,269 gross tons) fleet (17 trawlers and 11 long-liners) left Yokohama on May 2; and the Shikishima Maru (10,144 gross tons) fleet (24 trawlers) left Hakodate May 3.

The 700-ton mothership Fuji Maru specially chartered to fish for halibut in Area 3B North Triangle was scheduled to return to Japan in late May. The mothership's five long-line vessels are to be assigned to the Seifu Maru fleet. (Suisan Tsushin, May 4, 7, and 11, 1964.)

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#### BERING SEA VESSEL DEPARTURES:

The two 3,500-ton stern trawlers under construction for a Japanese fishing company were scheduled to be dispatched to the eastern Bering Sea in mid-July and late August. The departure of that company's Chichibu Maru No. 2 (1,693 gross tons) fleet, originally scheduled for early May, was postponed until late June or early July.

Other Japanese motherships scheduled to depart for the eastern Bering Sea in May were: the Seifu Maru (8,269 gross tons) accompanied by 28 catcher vessels, departing Japan on May 2, and the Itsukushima Maru (5,871 gross tons) accompanied by 9 trawlers and 9 long-liners, departing Hakodate, Japan, about May 15. (Suisan Tsushin, April 17 and 18, 1964.)

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#### SHRIMP FISHERY IN BERING SEA:

A large Japanese fishing company's shrimp factoryship Chichibu Maru (7,420 gross tons) has been fishing for shrimp in the Eastern Bering Sea with 12 trawlers. The factoryship had processed about 4,500 metric tons of shrimp as of early May 1964. Due to engine trouble, she was expected to return to Japan around May 20 for repairs, after which she will again depart for the Bering Sea shrimp grounds in August. (Suisancho Nippo, May 7, 1964.)

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#### JAPANESE ATLANTIC TRAWL FLEET:

By December 1964, 18 newly constructed Japanese trawlers are expected to be placed in operation in the Atlantic Ocean. This will enlarge the size of the Japanese Atlantic trawl fleet from 35 trawlers in operation as of March 31, 1964, to 53 vessels.

Of the 18 trawlers, 13 are vessels newly licensed by the Fisheries Agency in November 1963 to engage in the eastern Atlantic Ocean trawl fishery. Seven of the 13 trawlers (one 190-ton, five 299-ton, and one 2,500-ton vessels) were scheduled to be completed by June 1964, and 6 (one 290-ton, one 1,500-ton, one 2,530-ton, one 2,800-ton, and two 3,000-ton vessels) by October 1964.

The remaining 5 trawlers are those previously licensed for construction by the Agency. They include one 1,500-ton, two 2,800-ton, and

## Japan (Contd.):

two 3,400-ton trawlers. They were expected to be completed some time between May-December 1964.

In view of the high cost of constructing the trawlers, which may require 5 years to write off, some circles in the Japanese fishery are said to be entertaining doubts that the trawlers entering the Atlantic fishery can operate profitably. They hold the view that vessel owners entering the trawl fishery must bear in mind that, despite reports of good prospects of developing markets for trawl-caught fish, catches in the principal trawling grounds off Las Palmas are declining and that the composition of the catches has changed. (Suisancho Nippo, May 4, 1964.)

**Editor's note:** In November 1963, the following 13 classes of trawlers were licensed for operation off West Africa: 3,500-, 3,000-2,800-, 2,500-, 2,000-, 1,500-, and 500-ton--one each; 299-tons--six. Thus, 2 of the 13 trawlers under construction during mid-year 1964 (one of 2,500 tons and the 190-ton trawler) do not "fit" the licensing requirements.

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JAPAN MAY JOIN INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES:

The Japanese Government has for some time been studying the possibility of becoming a member of the International Commission for the Northwest Atlantic Fisheries. She was reported to be planning on sending as observers to the Commission's annual meeting (scheduled for Hamburg, Germany, June 1, 1964) the former Fisheries Agency investigation official; the First Secretary, Japanese Embassy, London; the chief, trawl fishing department, of one of Japan's largest fishing companies; and one other person.

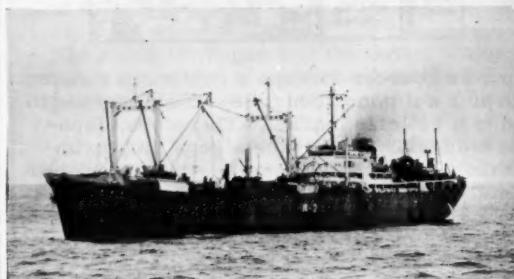
This move was being interpreted in Japan as a preliminary but positive step taken by the Japanese Government preparatory to joining the Commission. As of May 1964, trawlers licensed by the Japanese Government to operate in the North Atlantic were the Aoi Maru No. 2 (1,130 gross tons) and the Tenyo Maru No. 3 (3,700 gross tons). The latter trawler is fishing with two 300-ton trawlers (Chuyo Maru and Eiyo Maru). In addition, several large Japanese companies are reported as planning to operate large stern

trawlers in the North Atlantic in the near future. (Minato Shimbun, May 5; Nihon Keizai Shimbun, May 1, 1964.)

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FREEZERSHIP DEPARTS FOR LAS PALMAS TO PROCESS BOTTOMFISH:

The Japanese freezership Hoyo Maru (formerly the Renshin Maru 6,800 gross tons) was scheduled to depart Shimonoseki, Japan, on May 15, 1964, for Las Palmas, Canary Islands. The vessel, formerly operated by a Japanese fishing firm under the name of Fuji Maru, was remodeled and put to a test run off Japan early this year by another Japanese fishing firm.



Japanese mothership Hoyo Maru (formerly the Renshin Maru).

The Hoyo Maru was expected to arrive at Las Palmas in late June, where it will be used for about one year to freeze and process bottomfish, such as sea bream, squid, and octopus, to be purchased from about 40 local fishing vessels under an agreement concluded this past April between the Japanese firm operating the vessel and a Spanish firm. The freezership is expected to process in one year a total of 10,000 metric tons of fish, which will be exported to such countries as Spain, Italy, and Denmark, as well as shipped back to Japan.

A similar arrangement was concluded in the summer of 1963 between another Japanese firm and another Spanish fishing firm located in Las Palmas. That same Japanese firm has a five-year contract to purchase annually from the Spanish firm 6,000 metric tons of squid, sea bream, and octopus. (Suisan Tsushin, May 2, 1964, and other sources.)

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LARGE STERN TRAWLERS COMPLETED:

Two stern trawlers--Akebono Maru Nos. 71 & 72 (each of 3,500 gross tons)--under construction at Hakodate were expected to be completed in June and July, respectively, one

## Japan (Contd.):

month earlier than originally scheduled. Upon completion, they were to be dispatched to the North Pacific and Bering Sea. One large Japanese fishery firm built both vessels. The Akebono Maru No. 71 replaces the 1,500-ton stern trawler Akebono Maru No. 52 which has been operating in the eastern Bering Sea. The Akebono Maru No. 72 is expected to replace the 1,500-ton stern trawler Akebono Maru No. 51, operating in the Gulf of Alaska.



Japanese stern-trawler Akebono Maru No. 51.

Another firm's new stern trawler, Daishin Maru No. 15 (1,500 gross tons), was scheduled for launching on May 8 at the Osaka Shipyards, with final completion in late June. That stern trawler was scheduled to be sent to the Gulf of Alaska on her maiden trip. (Suisan-cho Nippo, May 2 and 12, 1964.)

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#### STERN TRAWLER COMPLETED FOR BERING SEA OPERATIONS:

A large Japanese fishing company accepted delivery of its new 2,800-ton stern trawler Taiyo Maru No. 82 on April 15, 1964. Built at a total cost of 800 million yen (US\$2.2 million), the vessel has the following specifications: length--82 meters (269 feet); beam--14 meters (50 feet); depth--9.2 meters (30 feet); engine--3,150 hp.; speed--12 knots; freezing capacity--45 metric tons per day.

The new stern trawler was to depart for the Eastern Bering Sea on April 24, 1964, accompanied by the 360-ton trawler Taiyo Maru No. 16. (Nihon Shimbun, April 22; Minato Shimbun, April 23, 1964.)

\* \* \* \* \*

#### TWO NEW STERN TRAWLERS SENT TO WEST AFRICAN FISHING GROUNDS:

Two new small stern trawlers were scheduled to depart from Japan for fishing grounds off West Africa on May 1, 1964. The new vessels are the 314-ton sister trawlers Kyoshin Maru Nos. 51 and 52. (Nihon Suisan Shimbun, April 22, 1964.)

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#### LARGE STERN TRAWLER COMPLETED FOR RUMANIA:

Construction of the second of two large stern trawlers ordered by Rumania was completed at a Japanese shipyard in mid-April 1964. Called the Galati, the trawler (3,631 gross tons) carries two 20-ton portable vessels, and is equipped with a fish-meal processing unit and fish-filleting equipment. Total construction cost was 1,008.0 million yen (US\$2.8 million). (Minato Shimbun, April 23, 1964.)

\* \* \* \* \*

#### VESSEL CONSTRUCTION, MAY 4, 1964:

On May 4, 1964, the Japanese Fisheries Agency issued permits for the construction of 22 fishing vessels: 9 wooden vessels (totaling 160 gross tons) and 13 steel vessels (totaling 2,394 gross tons). Included were permits for 9 steel tuna vessels: two 111-ton, two 192-ton, four 253-ton, and one 375-ton long-liners. (Suisan Keizai Shimbun, May 8, 1964.)

\* \* \* \* \*

#### NATIONAL PROGRAM TO PROMOTE FROZEN FISH SALES ESTABLISHED:

A meeting to formalize plans for promoting the consumption of frozen fishery products in Japan was scheduled for April 23, 1964, by the Director of the Japanese Fisheries Agency with the heads of six major Japanese fishing firms and the Japan National Federation of Fishermen's Cooperative Associations. Plans were that the program will be funded with a total capital of 40 million yen (US\$111,000), one-half to be financed by the industry and one-half to be subsidized by the Government. Government funds for the program have already been appropriated in the fiscal year 1964 (April 1964-March 1965) budget.

The proposed plans of the frozen fish promotion are:

## Japan (Contd.):

1. Purpose: The purpose of the program is to promote the sale of good-quality frozen fishery products to consumers at the retail level in an effort to create greater demands for those products. The mass media shall be utilized for promotional purposes.

2. Methods of Promotion and Sale: Advertising media, such as radio, television, and newspapers, as well as food exhibits, shall be utilized to introduce good methods of preparing frozen fishery products. Over 20 frozen fish retail stores shall be established in Tokyo to sell frozen fish products of improved quality.

3. Management Organization: The management organization, to be tentatively named the Frozen Fish Products Association, shall be formed by the organizations connected with the frozen fish industry. They shall include the Japan National Federation of Fishermen's Cooperative Associations (ZENGYOREN) and six fishery firms. The Association shall be chartered as a corporation qualifying for government subsidy and shall conduct the following activities:

(a) Publicity by means of advertising in newspapers, magazines, radio, and television; poster and pamphlet distribution, preparation and presentation of film slides; and presentation of food exhibits and cooking classes. (b) Quality improvement program to improve the image of frozen fish. For that purpose, quality and size standards, and a uniform labeling system for frozen products shall be established.

The newly formed Frozen Fish Products Association shall have a staff of 1 managing director, 1 executive director, 7 directors, 2 secretaries, and 3 staff personnel.

4. Frozen Fish Retail Stores: Frozen fish retail stores shall be established to acquaint the consumer with the advantages of buying and using frozen fish as follows:

(a) Member firms of the Association shall establish in Tokyo at least 20 retail stores displaying frozen fishery products. They shall provide guidance to store operators on how to stock and sell frozen fish products. (b) The selection of sites for the frozen fish stores, prod-

uct quality, price adjustments, and other matters requiring adjustment among the shop operators shall be handled by the existing Frozen Foods Promotion Association. (c) In view of the seasonal nature of fish supply, turnover of products, and space consideration for display cases, about 20 varieties of frozen fish products shall be placed on sale. All products shall bear standard labels showing that they conform to prescribed quality standards. Retail prices shall be fixed for all specified products and retailers shall conform to those prices as much as possible.

5. Frozen Foods Promotion Association: The existing organization (a corporation formed by four major frozen food producers) shall be expanded by soliciting for membership other producers in related industries, such as the frozen fish, electric appliance, and the food wrapper manufacturing industries.

The Association shall perform adjustment services (on matters related to selection of shop locations, quality and price determination for products) and assist in obtaining business capital. The Association shall have on its office staff 1 full-time worker and 3 members associated with the Frozen Fish Products Association. (Suisan Keizai Shimbun, April 17 & 22, 1964.)

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#### FISH SAUSAGE PRODUCTION, FISCAL YEAR 1963:

Data compiled by the Japan Fish Sausage Association show that a total of 130,206 metric tons of fish sausage and fish ham were produced in Fiscal Year 1963 (April 1963-March 1964). This represents a 14-percent increase over Fiscal Year 1962, when production totaled 114,125 metric tons. Production of fish sausage totaled 98,444 tons, representing a 28-percent increase over 1962 production of 76,832 tons, and production of fish ham sausage totaled 31,762 tons, showing a 15-percent decrease from the 37,293 tons produced in 1962. The increase in fish sausage production is attributed to improved methods of processing and marketing, the low price maintained for that product compared with the rising prices of beef and pork sausages and other food products, and increased consumption of fish sausage in farming and fishing communities. (Suisancho Nippo, May 1, 1964.)

\* \* \* \* \*

Japan (Contd.):

**SOUTH AFRICAN FISH MEAL  
TO BE IMPORTED BY JAPAN:**

The Japanese Fisheries Agency, after studying the request submitted by the Livestock Bureau, is reported to have approved the importation of 25,000 metric tons of South African fish meal in fiscal year 1964 (April 1964-March 1965). The South African fish meal is reported to have been contracted at a price of 54,142 yen (US\$150) a metric ton. (Suisan Keizai Shimbun, May 13, 1964.)

Editor's note: The press report did not state whether the price is f.o.b. or c.i.f.

\* \* \* \* \*

**US\$1 MILLION FOR SOUTH KOREAN  
IMPORTS ALLOTTED BY JAPAN:**

The Japanese Ministry of International Trade and Industry (MITI) was expected to formally approve a foreign fund allocation of US\$1 million for the importation of South Korean fishery products in fiscal year 1964 (April 1964-March 1965). Japanese producers and exporters had requested an allocation of US\$1.8 million and the MITI had recommended US\$1.3 million, the same as in fiscal year 1963. However, the Fisheries Agency had held firmly to an allocation of US\$1 million on grounds that it would not yet be advisable to liberalize imports from Korea since the Japan-Republic of Korea fisheries negotiation had not yet been concluded. The Agency also held that the 1963 allotment included a special appropriation of US\$300,000, and it would not at all be possible to predict whether a special need such as that which arose in 1963 would arise again in 1964. (Suisancho Nippo, May 7, 1964.)

\* \* \* \* \*

**JAPANESE-CANADIAN TALKS  
ON FISHING LIMITS PLANNED:**

A Japanese delegation was scheduled to arrive in Canada May 1, 1964, to conduct preliminary discussions with Canadian Government officials regarding Canada's proposal to enact unilaterally a 12-mile fishing limit based on the straight base-line concept. The Japanese delegation was said to consist of an official from the Japanese Fisheries Agency, an industry representative, and a counselor from the Japanese Embassy in Ottawa. (Nihon Suisan Shimbun, April 24, 1964.)

\* \* \* \* \*

**KELP FISHERY AGREEMENT  
WITH SOVIET UNION:**

An agreement was formally signed in Moscow on April 29, 1964, between Japan and the Soviet Union to extend for a one-year period the Japan-U.S.S.R. private kelp fishery agreement originally concluded on June 10, 1963. Representing Japan at the kelp negotiation was the President of the Japan Fisheries Society. The U.S.S.R. was represented by the Soviet Fisheries Minister.

The kelp agreement, concluded on a private basis between the Japan Fisheries Society and the Soviet State Fisheries Commission, permits up to 300 Japanese fishing boats to harvest kelp in approximately a 4.5-square-mile area off the Shigunarinui Island in the Nemuro Strait, northeast of Hokkaido. As in 1963, the Japan Fisheries Society will pay the Soviet Union a kelp harvesting fee of 12,000 yen (US\$33.34) per boat. Opening date for the kelp harvesting season was advanced from June 10 to June 1. Closing date is September 30, as in 1963. The 1964 kelp production is expected to total about 1,800 metric tons. The 1963 harvest totaled 1,200 tons. (Suisan Keizai Shimbun, May 1; Suisancho Nippo, April 30, 1964.)



**Mauritania**

**SIGNS 50-YEAR FISHERIES  
TREATY WITH SPAIN:**

Three treaties, one of which is on the fisheries, were signed by Mauritania and Spain at the capital city of Nouakchott on February 14, 1964. In the fisheries treaty, Spain agrees to construct and operate fish-processing plants at Port-Etienne in Mauritania, in return for the right for Spanish fishermen to fish Mauritanian waters on the same basis as that country's nationals.

The 50-year fisheries treaty is potentially of great importance to the development of Mauritania's major natural resources. It attempts to regulate the difficulties that have arisen between Spain and Mauritania since the latter's independence over the traditional use of Mauritanian territorial waters by Canary Islands-based Spanish fishermen. It gives Spain the right to fish in Mauritanian waters under the same conditions as Mauritanian nationals, in return for sizable Spanish investments in fish-processing facilities at Port-Etienne, and the right of free repatriation of profits from such industries.

### Mauritania (Contd.):

In the treaty, Spain specifically guarantees: (1) to build and operate a salting and drying plant within 18 months with an annual capacity of 6,000 metric tons; and within 24 months, a cannery with an annual capacity of 3,000 tons; and a fish-meal factory capable of treating 100 tons of fresh fish daily; (2) to document 20 to 50 Spanish fishing vessels under Mauritanian registry, subject to Mauritanian laws; (3) for Spanish vessels fishing Mauritanian waters, to pay an annual royalty of US\$10 a gross ton; and (4) train Mauritanian commercial fishermen in Spanish schools and as crewmen aboard Spanish vessels fishing Mauritanian waters.

In addition to permitting the use of Mauritanian waters and repatriation of profits, Mauritania agrees to: (1) grant Spanish fisheries enterprises most-favored-nation administrative, customs, and tax treatment; (2) make available the necessary construction sites for the projected industrial establishments; and (3) reserve to Spanish fishermen the necessary storage space in the projected refrigeration facilities at Port-Etienne for the fish used in 15 days' operations in the canning and fish-meal plants. (United States Embassy, Nouakchott, March 30, 1964.)

Note: See Commercial Fisheries Review, October 1963 p. 60.



### Mexico

#### POSSIBLE EFFECTS OF SHRIMP VESSEL TIE-UP AT MAZATLAN:

The decision of shrimp vessel owners in Mazatlan, Mexico, on May 6, 1964, to halt operations of 100 privately owned vessels was believed would result in greatly reduced shrimp catches during the final 2 months of the 1964 fishing season. The shutdown was caused by steadily worsening catches that made fishing unprofitable.

Mazatlan is the principal shrimp port of Mexico with 270 to 300 vessels of the approximately 600 operating out of Pacific Coast ports. With a large segment of the Mazatlan shrimp fleet tied up, including many of the best vessels, several packing plants closed down. Although vessels belonging to the cooperatives and some privately owned vessels continued to fish out of Mazatlan for those plants that were still operating, the partial

tie-up coupled with generally poor fishing was believed would result in very small shrimp landings. That could reduce shrimp shipments to the United States for the remainder of the season to July 15, 1964. The atmosphere for negotiating next year's contract between vessel owners and fishermen may also be impaired.

The existing contract between vessel owners and the crew members who belong to the several cooperatives was based on the good fishing and high prices that prevailed during the previous season (1962/63). It called for the crew to receive 45 percent of the gross catch and required the crew to pay only for provisions, with the owner paying all other expenses. When the price of shrimp dropped to pre-1963 prices and catches slumped while operating costs remained unchanged, returns dropped below the break-even point, according to the vessel owners. Some of the cooperatives were also reported to be overextended and in a poor credit position. Tension was reported between the cooperatives and vessel owners all season as the fishermen scouted all available shrimp grounds from south of San Blas, Nayarit, to the outer coast of Baja California, and fishermen from Topolobampo in northern Sinaloa reportedly penetrated into the Mazatlan fleet's traditional areas.

Because of this year's poor results, a number of Mexican shrimp vessels have left to work new grounds off French Guiana. Other owners are ready to send their vessels to French Guiana, and reportedly over 500 fishermen including highline skippers have applied to go with them. The 12 vessels being built at Mazatlan for export to Kuwait will require 36 officers and crewmen, and the shipyard building the vessels reports "hundreds" of applications. A feeling of pessimism pervaded the Mazatlan shrimp fishery. (United States Embassy, Mexico, May 18, 1964.)



### Morocco

#### FISHERIES TRENDS, FIRST QUARTER 1964:

The first quarter is traditionally the slack season for the Moroccan fishing fleet. This year bad weather prevented the start of the sardine fishing season at Safi at the usual time, and it was not expected that the catch would reach important proportions until the end of April. Farther south at Agadir, the

**Morocco (Contd.):**

local vessels with limited range had still not found sardines in commercially important quantities by mid-April 1964.

The past two years have seen strenuous objections by French fishermen against the arrival of frozen Moroccan sardines on the French market during the peak of the French fishing season. As a result, the French and Moroccan Governments have agreed to suspend exports of Moroccan frozen sardines to France during the summer. The late start in the Moroccan sardine fishery may, therefore, result in important reductions in sales.

The possibility of expanding the Moroccan tuna catch has continued to attract attention. A team of consultants from the United States Agency for International Development had previously recommended a careful exploration of offshore tuna fishing grounds using a modern fishing vessel. For various financial and technical reasons, United States vessels were not suitable for the project, so a French vessel has been chartered to carry out a one-year study of the tuna potential off Morocco. (United States Embassy, Rabat, April 24, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 65.

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**TANGIER FISH MARKET SALES, 1963:**

In 1963, the Tangier Fish Mart received 1,000 tons of tuna (includes a small quantity of bonito, mackerel, and swordfish) from the fishery in the Cape Spartel region. Of that total, 738 tons were immediately sold while 262 tons were exported.

The Tangier Fish Mart in 1963 also received 2,378 tons of fish other than tuna (1,468 tons from the inshore net and small-boat fishery and 910 tons from the coastal fishery) and 71 tons of shellfish. Most of those receipts were immediately sold and only a small quantity was used for canning or freezing.

The Tangier Fish Mart makes no distinction between fish landed at Tangier and fish trucked in from Alhoceima or Larache. (United States Embassy, Rabat, April 3, 1964.)

**Netherlands****MARINE OIL INDUSTRY TRENDS, 1963,  
AND ANTARCTIC WHALING  
RESULTS, 1963/64 SEASON:**

Marine Oil Industry Trends, 1963: In calendar year 1963, the Netherlands imported 95,500 metric tons of fish oil, including 26,456 tons of whale oil. Netherlands use of fishoil in edible products during 1963 amounted to about 82,500 tons compared with similar use of about 47,500 tons of soybean oil, 43,300 tons of palm oil, and 30,000 tons of coconut oil. (United States Embassy, The Hague, April 27, 1964.)

Antarctic Whaling Results, 1963/64 Season: The Netherlands Whaling Company announced that the Dutch whaling expedition caught 343 international blue-whale units during the 1963/64 Antarctic whaling season, which was 257 units short of its quota of 600 units per-

Product	Season		
	1/1963/64	1962/63	1961/62
Whale oil . . . . .	(Metric Tons)	8,026	10,527
Sperm oil . . . . .		2,578	2,927
Meat meal . . . . .		978	1,275
Frozen meat . . . . .		1,194	1,108
Meat for Japanese refrigerator ship . . . . .		6,045	7,284

1/Preliminary.

mitted under the International Whaling Agreement. (United States Consulate, Amsterdam, April 27, 1964.)

\* \* \* \* \*

**NEW TRAWLER "TINIE CORNELIA":**

The dual-purpose trawler Tinie Cornelia was recently completed by a Dutch shipyard in Breskens. The vessel can be used as a stern trawler, or as a double-rig beam trawler. When twin-beam trawling, the two derricks on the vessel are topped up and the warps rove through the sheaves on each end. When stern trawling with a standard-type trawl, however, the derricks are lowered on to the strong back aft and the sheaves are used as towing blocks.

The derricks have been arranged in such a way that the risk of capsizing should the trawl come fast is minimized.

The principal dimensions of the Tinie Cornelia are: length overall 21.2 meters (69.5

## Netherlands (Contd.):

feet), breadth 5.6 meters (18.4 feet), and depth 2.6 meters (8.5 feet). The vessel's refrigerated fishroom has a capacity of 47 cubic meters (61.47 cubic yards), and accommodations are provided for a crew of 7.

The vessel is driven by a 380-horsepower Diesel engine, and is equipped with electro-hydraulic steering gear. The winch is situated well forward beneath the wheelhouse, and can be controlled from the bridge. Electronic fish-finding and navigational equipment are also provided. (World Fishing, April 1964.)



## Norway

EXPORTS OF CANNED FISH,  
JANUARY 1-FEBRUARY 22, 1964:

Norway's total exports of canned fish in January 1-February 22, 1964, were up 12.5 percent from those in the same period of 1963. Shipments of canned brisling were up 15.5 percent and of canned small sild up 12.8 percent. Other Norwegian canned fishery products were also exported in greater quantity in early 1964.

Norwegian Exports of Canned Fish, January 1-February 22, 1963-1964		
Product	Year	
	1/1964	1963
Brisling . . . . .	948	821
Small sild . . . . .	1,955	1,733
Kippered herring . . . . .	470	438
Soft herring roe . . . . .	38	14
Sild delicatessen . . . . .	72	65
Other canned fish . . . . .	282	320
Shellfish . . . . .	260	188
Total . . . . .	4,025	3,579

1/Preliminary.

The Norwegian winter herring fishery in 1964 yielded a better catch than in the previous year and by March 14, 1964, the Norwegian kippered herring canned pack amounted to 206,524 standard cases compared with only 70,862 cases in the same period of 1963.

Norwegian production of canned soft herring roe also increased considerably in early 1964 and by mid-March amounted to 16,078 cases of  $\frac{1}{2}$  ovals and 28,276 cases of  $\frac{1}{4}$  oblong cans as compared to 5,757 cases of  $\frac{1}{2}$  oval and 15,968 cases of  $\frac{1}{4}$  oblongs in the same pe-

riod of the previous year. (Norwegian Cannery Export Journal, April 1964.)

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NORWEGIAN STERN-FISHING  
FACTORY TRAWLER LANDS FROZEN  
PROCESSED CATCH IN ENGLAND:

The Norwegian factory trawler Longva completed its fourth fishing trip when it arrived in Grimsby, England, March 31, 1964, with a capacity load of 400 tons of frozen fillets (mainly skin-on cod fillets in 10-pound blocks). The owners of the 1,092-gross-ton vessel have contracted to deliver the vessel's catch in 1964 to a British distributor of frozen fishery products. The 400 tons of fillets delivered in March were processed aboard the Longva from a catch of about 14,000 kits (1,960,000 pounds) taken during a 3-months trip in early 1964. (The average catch by a conventional British trawler during a typical 22-day trip is said to amount to about 2,000 kits, or only 280,000 pounds.)

With an overall length of 208 feet, the Longva is only about 30 feet longer than the average British deep-water trawler. The Norwegian vessel is considerably shorter than British factoryships and freezer-trawlers. The Longva has an extremely compact design, and additional space was saved by not installing a fish meal plant. Some waste products are frozen on the vessel for animal food, but oil is generally discharged into the sea.

The Captain of the Longva said the vessel's operations in early 1964 had included 2 weeks of fishing off the west coast of Greenland where the temperature was below  $-25^{\circ}$  C. ( $-13^{\circ}$  F.). The Longva can operate in extreme weather conditions because all fish handling is done below deck. When the cod end approaches the vessel during net hauling, it is taken up until suspended from the rear bipod mast. A large steel hatch door then opens beneath it, giving direct access to the rear of the fish-processing factory below the fishing deck. During the brief period the hatch is open, the cod end is opened and the catch--about three tons, on average--is discharged directly into pounds below deck. In the air-conditioned and heated fish factory, fish can be fully processed and delivered to cold storage within two hours after landing. Fish processing equipment on the vessel includes heading, filleting, and skinning machines which can be geared to process up to 20 tons of fillets a day.

## Norway (Contd.):

The Longva was built in late 1962 at Aalesund, Norway. (Fish Trades Gazette, April 11, 1964.)

Note: See Commercial Fisheries Review, April 1963 p. 66.

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## SUPPLY AND DISPOSITION OF MARINE OILS, 1963 WITH COMPARISONS:

In 1963, Norwegian production of marine oils (table 1) was 34 percent below that in the previous year due to a sharp decline in the yield from the 1962/63 whaling season in the Antarctic. Norwegian production of marine oils in 1964 was expected to continue at about the same level as in 1963.

Table 1 - Norwegian Production of Marine Oils, 1962-1963, and Forecast for 1964			
Item	Forecast 1964	1/1963	2/1962
Cold-cleared cod-liver oil . . . . .		(Metric Tons) . . . . .	
Other fish-liver oils . . . . .	10,000	4,100	5,500
Herring oil . . . . .	60,000	6,100	1,000
Total fish and fish-liver oils . . . . .	70,000	70,200	67,500
Seal oil . . . . .	2,500	2,000	2,800
Sperm oil:			
Antarctic . . . . .	8,500	7,378	12,020
Shore stations (Norway) . . . . .	800	916	687
Total sperm oil . . . . .	9,300	8,294	12,707
Whale oil:			
Antarctic . . . . .	34,000	31,423	85,015
Shore stations (Norway) . . . . .	500	209	847
Total whale oil . . . . .	34,500	31,632	85,862
Total marine oils . . . . .	116,300	112,126	168,869

1/Preliminary.

2/Revised.

The decline in Norwegian whale oil production in 1963 was only partly offset by heavier imports (tables 2 and 4). As a result, the Norwegian supply of crude whale and herring oil during 1963 was down 10 percent from the previous year, even though there were substantial stocks on hand January 1, 1963.

Norwegian exports of unrefined marine-animal oils (table 5) were down sharply in 1963 due mainly to smaller shipments of whale oil. The decline affected all the important unrefined marine oils exported by Norway except fish-liver oil. (In 1963, the leading buyers of Norwegian fish liver oil--other than medicinal cod-liver oil--were Czechoslovakia with 2,993 metric tons, West Germany with 1,945 tons, Sweden with 1,837 tons, Italy with 1,830 tons, and Denmark with

Table 2 - Norwegian Supply and Disposition of Crude Whale and Herring Oil, 1961-1963, and Forecast for 1964

Item	Forecast 1964	1/1963	2/1962	1961
..... (Metric Tons) .....				
Supply:				
Stocks, January 1 . . . . .	60,129	71,336	54,163	67,929
Production:				
Whale oil . . . . .	34,224	31,632	85,864	114,715
Herring oil . . . . .	60,000	60,000	61,000	59,000
Total production . . . . .	94,224	91,632	146,864	173,715
Imports:				
Whale oil . . . . .	-	11,715	1,674	79
Herring oil . . . . .	-	53,278	51,858	33,677
Total imports . . . . .	-	64,993	53,532	33,756
Total supply . . . . .	-	227,961	254,559	275,400
Disposition:				
Exports:				
Whale oil . . . . .	-	25,631	65,948	67,656
Herring oil . . . . .	-	98	125	398
Total exports . . . . .	-	25,729	66,073	68,054
Processed by hardening industry <sup>3/</sup> . . . . .	-	142,103	117,150	153,183
Stocks, December 31 . . . . .	-	60,129	71,336	54,163

1/Preliminary.

2/Revised.

3/Data computed by deducting year-end stocks and exports from total supply; the export figures are complete but the year-end stocks may include oil not included in the reported supply.

Table 3 - Norwegian Supply and Disposition of Hardened Fats and Oils from Fish and Marine Animals, 1961-1963

Item	1/1963	2/1962	1961
..... (Metric Tons) .....			
Supply:			
Stocks, January 1 . . . . .	8,230	7,803	13,325
Production . . . . .	136,536	113,179	105,968
Imports:			
Edible . . . . .	2,012	1,125	372
Inedible . . . . .	-	47	13
Total imports . . . . .	2,012	1,172	385
Total supply . . . . .	146,778	122,154	119,678
Disposition:			
Exports:			
Edible . . . . .	59,982	40,922	45,396
Inedible . . . . .	27,058	20,902	10,479
Total exports . . . . .	87,040	61,824	55,875
Domestic disappearance <sup>3/</sup>	52,000	52,100	56,000
Stocks, December 31 . . . . .	7,738	8,230	7,803

1/Preliminary.

2/Revised.

3/The main consumer is the margarine industry; estimated consumption outside the margarine industry is only about 1,200 metric tons.

1,253 tons. Norwegian exports of medicinal cod-liver oil in 1963 amounted to 2,158 tons and the United States was the leading buyer with 500 tons.)

In 1963, Norwegian production of hardened fats and oils from fish and marine-animal oils (table 3) was up considerably from the previous year. Exports absorbed the increase,

## Norway (Contd.):

Table 4 - Norwegian Imports of Selected Marine Oils, 1963

Commodity and Country of Origin	Quantity	Value	
	Metric Tons	Kr. 1,000	US\$1,000
<u>Whale Oil, Crude:</u>			
Netherlands . . . . .	1,988	1,973	276
United Kingdom . . . . .	2,031	2,874	402
Iceland . . . . .	1,046	1,344	188
Japan . . . . .	6,649	9,346	1,307
Other countries . . . . .	-	-	-
Total . . . . .	11,714	15,537	2,173
<u>Sperm and Bottlenose Oil, Crude:</u>			
Denmark . . . . .	556	1,014	142
Australia . . . . .	464	849	119
Total . . . . .	1,020	1,863	251
<u>Herring Oil, Crude:</u>			
Iceland . . . . .	16,590	13,508	1,889
West Germany . . . . .	15,265	14,784	2,068
United States . . . . .	8,186	8,059	1,127
Peru . . . . .	6,505	5,120	716
Other countries . . . . .	6,732	11,289	1,579
Total . . . . .	53,278	52,760	7,379
<u>Cod-Liver Oil:</u>			
Total all countries . . . . .	1,011	1,312	183
<u>Industrial and Mixed Fish-Liver Oils:</u>			
Iceland . . . . .	3,233	3,905	546
Other countries . . . . .	158	153	21
Total . . . . .	3,391	4,058	567
<u>Residual Fish-Liver Oils:</u>			
Sweden . . . . .	867	472	66
West Germany . . . . .	2,357	1,478	207
Other countries . . . . .	148	75	10
Total . . . . .	3,372	2,025	283
<u>Other Crude or Refined Fats and Oils from Fish and Marine Animals:</u>			
West Germany . . . . .	1,570	1,683	235
Peru . . . . .	1,831	1,073	150
Other countries . . . . .	161	125	18
Total . . . . .	3,562	2,881	403

Table 5 - Norwegian Exports of Unrefined Marine Oils, 1960-1963

Product	1/1963	2/1962	1961	1960
(Metric Tons) . . . . .				
Whale oil, crude . . . . .	25,631	65,948	67,656	65,555
Sperm and bottlenose oil, crude . . . . .	4,664	12,975	8,815	8,682
Seal oil, crude . . . . .	1,773	2,646	2,117	3,859
Herring oil, crude . . . . .	98	125	398	199
Fish-liver oil . . . . .	18,078	14,950	18,767	15,564
Other unrefined marine oils . . . . .	5,590	8,988	8,582	4,989
Total . . . . .	55,834	105,632	106,335	98,848

1/Preliminary.  
2/Revised.

since domestic consumption of hardened marine oils by the margarine industry was about the same as in the previous year. There has been a steady drop in the use of marine oils in Norway's production of margarine

from 57,170 tons in 1960 to 50,095 tons in 1963.

Note: See Commercial Fisheries Review, July 1963 p. 89.

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### SHIPIARDS TO BUILD SHRIMP VESSELS FOR KUWAIT:

A Norwegian shipbuilding sales organization has arranged to deliver 8 shrimp-fishing vessels and 1 supply vessel to the Kuwait National Fishing Company. The terms of the Kr. 20 million (US\$2,793,000) contract call for cash upon delivery within one year. The Norwegian contractor will build 1 of the 8 trawlers. The firm has subcontracted with other Norwegian shipyards to build the other 7 trawlers and the supply vessel. (News of Norway, April 30, 1964.)

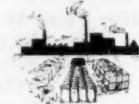


### Peru

#### FISH MEAL PRODUCTION AND EXPORTS, JANUARY-MARCH 1964:

Peruvian fish meal production in January-March 1964 was reported to be 496,000 metric tons, or 58 percent more than the 314,000 tons produced during the first quarter of 1963.

Peruvian fish meal exports during the first 3 months of 1964 amounted to 389,000 tons, up only 9.6 percent from the 355,000 tons exported in the same period of 1963. Fish meal inventories at the end of the first quarter of 1964 were said to total 258,000 tons as compared with inventories of 149,000 tons at the end of January-March 1963. (Unpublished sources.)



### South Africa

#### FISHERIES TRENDS, EARLY 1964:

Following are excerpts from a report in the The Southern Africa Financial Mail, April 10, 1964, describing recent developments in the fishing industry of the South Africa Republic (including South-West Africa):

Summary: Fishing expectations and early results for 1964 indicate that the pilchard-masbunker shoal fishery may be headed for its seventh successive record year. While inshore fishing will produce the bulk of the 1964 catch, there are also interesting developments

**South Africa (Contd.):**

in deep-sea trawling, tuna fishing, and exploratory fishing.

**Pilchard-Maasbanker Fishery:** At Walvis Bay (South-West Africa), where just over 600,000 short tons of pilchards were landed at the jetties of 6 factories in 1963, a fleet of about 70 vessels in early April 1964 was taking fish about 6 to 7 hours sailing from port. Although that was farther away than normal, the trips were repaid by the excellent condition of the fish which yielded 16 to 18 gallons of body oil from each ton caught.

Plans called for the completion of 2 new fish meal factories in South-West Africa in June 1964. With the advent of the 2 new factories (1 in Walvis Bay and 1 in Luderitz), the South-West Africa pilchard quota has been raised to 720,000 short tons for 1964 (630,000 tons for Walvis Bay and 90,000 tons for Luderitz).

The South Africa Republic's Cape West Coast shoal fishery was hampered early in 1964 by the appearance of pilchards farther south than usual. The fish were found in the False Bay and Robben Island areas, which was a boon to the 2 factories at Hout Bay and the 1 at Gansbaai, but unfavorable to the majority of factories located at Saldanha Bay and further north. Vessels from the West Coast had to travel from 50 to well over 100 miles to take their catches. Despite the extended vessel trips, the pilchard-maasbanker catch of the South Africa Republic during the first 2 months of 1964 was 130,640 tons as compared with 119,973 tons in the same period of 1963. In the South African Cape West Coast shoal fishery there is no catch limit, but the season lasts only to the end of July.

Late in 1963 there were indications that another fish meal factory license might be granted to a group of leading South African fishermen. However, it is believed that some concern over heavy fishing of the pilchard shoals may persuade the South Africa Department of Commerce and Industries to postpone a decision on the new license, at least during 1964.

With indications of an increased catch in both South Africa and South-West Africa, it may be possible to reach the 1964 fish meal production goal of 300,000 short tons. (Editor's Note: That goal equals the 1964 export

quota assigned to South Africa by the Fish Meal Exporter's Organization.) More than 75 percent of the anticipated production has been sold in advance at a good price and there are ample markets for the remainder.

Once again, canned fish production will be limited and is not likely to exceed 2.5 million cases in 1964, which would be only half the canned fish pack of 5 million cases in 1960.

**Offshore Trawling:** A new company has been formed by South African-Spanish interests to carry out deep-sea trawling operations. Although detailed plans have not been announced, it is expected that the company will operate 4 to 6 large trawlers and establish a freezing and processing plant in South Africa at Saldanha Bay.

Another South African company was due to take delivery in May 1964 of the 130-ton stern trawler Sea Horse, the first of several trawlers being built for the company by a British shipyard.

A third South African company will start taking delivery in 1964 of 7 side trawlers and 2 stern trawlers being built for the company in Aberdeen, Scotland. In addition, a South African shipyard in Durban is completing two new stern trawlers for another South African fishing company which will operate the vessels from Port Nolloth.

**Tuna Fishing:** The potential tuna fishery off South Africa is also attracting investment. The former navy corvette Justin has been converted for tuna long-line fishing at a Durban shipyard at a reported cost of R100,000 (US\$139,000) by a South African company. The vessel will be used off South Africa.

Another South African company has been operating the converted refrigerated cargo vessel Marinette as a tuna vessel and is purchasing two more vessels in Europe for the tuna fishery.

**Fisheries Development:** The Fisheries Development Corporation of South Africa Ltd. is expanding its activities. (Editor's Note: Formed in 1944 under Section 2 of the Fishing Industry Development Act, the Corporation was created as a semipublic body with half its capital of almost \$2.8 million subscribed by the State.) As part of its new work in resource development, the Corporation has begun exploratory fishing and gear research to

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## South Africa (Contd.):

find out if shrimp and anchovies can be caught commercially off South Africa. (United States Consul, Cape Town, April 21, 1964.)

Note: See Commercial Fisheries Review, May 1964 p. 72, Mar. 1964 p. 67, Dec. 1963 p. 78, Oct. 1963 p. 64.

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PILCHARD-MAASBANKER  
FISHERY, JANUARY 1964:

The shoal fish catch off the Cape west coast of the South Africa Republic in January 1964 was 63,781 short tons pilchards, 3,666 tons maasbanker, and 594 tons mackerel for a total of 68,041 tons. That compares with 44,611 tons pilchards, 165 tons maasbanker, and 4,278 tons mackerel landed in January 1963.

The January 1964 catch yielded 15,765 short tons of fish meal, 563,874 imperial gallons of fish body oil, 312,456 pounds of canned pilchards, 533,208 pounds of canned maasbanker, and 125,088 pounds of canned mackerel. (The South African Shipping News and Fishing Industry Review, March 1964.)

**Republic of Togo**FISHERY PRODUCTS IMPORTS FROM  
SOVIET UNION INCREASE IN 1963:

In 1963 the Soviet Union increased its exports of fishery products to Togo. Imported frozen fishery products of Soviet origin appear to have become very popular with the Togolese and are reported to be unloaded and sold directly from rail cars to the Togolese market women. Despite the noticeable increase and frequency of such imports, the consumer demand has kept pace with supplies and there has been no indication of a saturated market.

A four-man team of German fishing experts is expected to arrive in Togo during 1964. They will bring with them two 39-foot fishing vessels for offshore fishing. Two of the German experts will work with the Togolese in training them to operate the 2 vessels and the 2 other experts will teach the Togolese how to preserve and distribute fish. (United States Embassy, Lome, April 21, 1964.)

**U.S.S.R.**SOVIET FISHING INDUSTRY:

Following are excerpts from a report by Alexander Ishkov, chairman of the Soviet State Committee of Fisheries:

Fisheries Landings: In 1963, landings by Soviet fishing vessels and whalers reached 4.5 million metric tons, exceeding the planned target by 380,000 tons. The Soviet catch goal for 1964 calls for landings to increase by 400,000 tons to 4.9 million tons; and in 1965, landings are expected to rise to well over 5 million tons.

The Soviet Union has nearly 29,000 miles of sea coast, opening onto a variety of seas, as well as some 211,000 miles of rivers, many of which are very large. The Soviet Union also has over 200,000 large lakes, covering nearly 12,000 square miles. Those include 102 artificial lakes created mainly in connection with hydro-electric and irrigation schemes. Those lakes are being developed as hatcheries for salmon, sturgeon, and other fish.

Fishing Fleet: The development of the Soviet fishing industry has required major capital expenditures. Seven out of 10 vessels and auxiliaries now operating in Soviet fisheries have been built in the last 10 years, and 120 new large vessels should be added in 1964, including 21 refrigerated trawlers. Many of the new vessels have been built in Soviet shipyards, but even more have been built to Soviet order by shipyards in Poland, East Germany, Finland, Japan, Denmark, West Germany, and certain other countries.

Construction of Soviet fishing vessels abroad is continuing. Poland, for example, is at work on a series of fishery motherships to serve Soviet distant-water fleets. Polish shipyards also plan to deliver a series of large factory trawlers to the Soviet Union during the next two years. Each of the new factory trawlers should be capable of catching and processing 5,500-6,000 tons of fish annually.

As recently as 15 years ago, vessels operating from Soviet Baltic ports, which then constituted a major part of the Soviet fishing fleet, consisted only of small schooners which operated only in coastal waters. The Soviet Baltic fleet now includes numerous modern fishing vessels capable of operating in distant waters such as the fishing area now in active exploitation off west Africa. The Soviet Baltic

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**U. S. S. R. (Contd.):**

fleet is supported at Illaipeda, Tallinn, and other ports by refrigerated warehouses and processing factories.

The Soviet Far Eastern fishing fleet, includes about 200 modern fishing vessels and 10 floating fish canneries which operate for 5 months of the year around the Kurile Islands. Those vessels landed about 500,000 tons of fish and other sea products in 1963, and are expected to increase their catch in 1964.

The Soviet herring fleet, operating from Murmansk and other ports on the Barents Sea, is fishing in the North Atlantic. The fleet, which has been aided by the research done by the submarine Severyanka, is catching large herring at depths of 1,000 feet, and in certain areas at depths of 2,000-2,300 feet.

Other Soviet fleets are operating in the Black Sea and Sea of Azov, and in the Caspian Sea.

**Fisheries Research:** There are now 20 Soviet research institutes engaged in fishery research, with 4,000 scientists and technicians working out plans for further development of the fishing industry.

As a result of Soviet research, five special Soviet vessels will be fishing for tuna in the Indian and Pacific Oceans, and others will be fishing in the northwestern part of the Indian Ocean for tuna, "scomber," sailfish, and mackerel. (World Fishing, April 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 73, March 1964 p. 70, and February 1964 p. 84.

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**PACIFIC SALMON HATCHERIES AND FISHERIES:**

The Chief of the Research Section of the Hokkaido (Japan) Salmon Hatchery, Japanese Fisheries Agency, and his assistant visited Primorskaya, Okhotsk, Kamchatka, and Sakhalin on the Pacific Coast of the Soviet Union in 1957 and 1959, respectively. They were participants in an exchange program on fishing techniques between the Soviet Union and Japan. There observations on Soviet fisheries have been kept current by information from visitors to the Soviet Union and dealings with Soviet delegations to Hokkaido. Following are some of their impres-

sions of the Soviet salmon hatcheries and fisheries in the Pacific coast:

**Hatchery Program:** The Japanese believe that the Soviets will rely on their natural salmon runs until the resource shows strong evidence of depletion. Only then will the Soviets begin full-scale development of their salmon hatcheries. The fact that only two members of Soviet fisheries delegations to Japan have been hatchery personnel suggests the low priority of the program at present. Earlier, during a joint scientific conference between the Soviet Union and Japan, the Soviets described plans to expand hatchery programs in Sakhalin, the Kurile Islands, and the Amur River area. But a visiting fisheries team from Japan in 1963 found no pronounced increase of hatchery activity in those areas.

The Japanese, however, were impressed by the overall administration of the hatchery program and the natural resources available to the Soviets. One river in Kamchatka is said to have more salmon than all the rivers of Hokkaido combined. Poachers pose little problem and wide rivers allow the salmon to swim unmolested to their natural spawning grounds. This contrasts with Japanese experience where the fish must be caught in midstream, then artificially transported to spawning areas. Soviet scientists also had such advantages as the use of helicopters to fly to and from hatcheries in remote areas.

The Soviet hatchery method is the same as the Japanese, both of which are similar to certain United States methods. One Soviet variation in technique, however, is the placing of incubation trays with eggs in a large indoor rearing pond rather than in troughs through which spring water runs as is the practice in Japan. The Japanese also stated that little encouragement is being given to the breeding of hybrid stock in the Soviet Union.

**Fishing Industry:** The Japanese were generally unimpressed by the Soviet salmon fishing industry and felt their own plants and techniques were superior. They reported that some Soviet salmon canneries were sorting and packing by hand, and using equipment installed by Japanese firms some years ago.

**Standard of Living:** To compensate for the remoteness and seasonal nature of the work, Soviet wages in the Pacific salmon fishing industry were set at 1.5 times the community average, and other incentives such as the de-

**U. S. S. R. (Contd.):**

Development of recreation facilities, and a 10-percent annual increase in wages were used to retain workers.

The price of food was comparable to or only slightly higher than that in Japan, but the price of clothing was 4 to 5 times the Japanese level. (United States Consulate, Sapporo, April 15, 1964.)

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**NORTH PACIFIC WHALING FLEET TO BE INCREASED:**

The Soviet Fisheries Minister is reported to have informed the Production Chief of the Japanese Fisheries Agency that his Government plans to operate 4 whaling fleets in the Aleutian Island waters in 1964, according to informed sources in the Japanese Government. The Soviet Union operated 2 whale fleets in 1962 and 3 in 1963.

Japan intends to operate 3 mothership-type whaling fleets in the North Pacific, as before. They include the motherships Kinjo Maru (10,912 gross tons), Nitto Maru (12,933 gross tons), and the Kyokuyo Maru (11,449 gross tons). The three motherships were scheduled to depart Japan on May 20, 1964. (Suisan Keizai Shimbun, May 5; Suisancho Nippo, May 12, 1964.)

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**ELECTRONIC FISHING GEAR BEING TESTED:**

A Soviet research vessel has successfully conducted experiments in the equatorial Atlantic Ocean with electronic fishing gear, which can be used to catch sardines without the use of a net. The gear consists of a 100-kilowatt generator and a fish-suction pump, according to a Tass News Agency report dated April 16, 1964. Sardines attracted by means of a night light are "guided" to the mouth of the fish pump by means of electrical charges released in the water. The fish are then caught by suction. It is reported that by this method 3 to 4 tons of sardines can be landed in one night's fishing.

In the Pacific Ocean, the Soviet fishing vessel Yuri Gagarin is reported to have been experimentally fishing for saury with this type of electronic fishing gear for several years, achieving considerable success. So-

viet fishing gear experts are also said to be experimenting with electronic trawl gear to improve Soviet bottom-fishing techniques. (Suisancho Nippo, May 2, 1964.)

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**UNDERWATER CRAFT DESIGNED FOR BARENTS SEA STUDIES:**

The Soviet Institute for Scientific Research in Fisheries and Oceanography in the Arctic has designed and started construction of a self-surfacing bathyscaphe for investigations in the Barents Sea. It will carry a crew of 3 and will be able to work at depths up to 100 meters (328 feet), remaining submerged for up to 5 days. (World Fishing, April 1964.)

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**FISHERY DEVELOPMENTS SINCE 1913:**

The Soviet Government's aim in the fisheries is first and foremost to develop their fisheries to such a level that they fully and clearly meet the needs of the country. Therefore, the development and management of the fishing fleet are neither for profit nor export.

Parallel with the development of the fishing fleet, the U.S.S.R. has built an entire fleet of research vessels and exploratory ships for scientific investigations and for guiding the fishing fleet. The Soviets now have between 80 to 100 such vessels, which undertake investigations on all the most important fishing regions in the world. For example, they have recently undertaken research and fishing explorations in the Indian Ocean and will soon begin regular fishing there. The object of the States Fishery Committee is the rational utilization and conservation of the stocks of fish, and the Soviets cooperate as best they can with other countries which have the same viewpoint about carrying on the fisheries. Within the U.S.S.R., in rivers and lakes, the Soviets are also striving purposefully to protect the stocks of fish and to carry on fish rearing.

In 1913, the total Soviet catch was 1 million metric tons of which 200,000 tons were ocean fish and the rest (about 80 percent) were caught in the Caspian Sea, rivers, and lakes. In 1940, the total catch was 1.4 million tons, of which 556,000 tons were ocean fish. In 1950, the total catch increased to 1.75 million tons, and of this, the ocean fishery accounted for about 810,000 tons, or about half the total. The Soviets calculated that their total production for 1963 would be about 4.2 million tons, but in

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## U. S. S. R. (Contd.):

November, the fishing fleet exceeded the production plans and the total catch for the year was expected to amount to about 4.5 million tons. The Soviet fishery in the Caspian Sea, rivers, and lakes together yield about 800,000 tons, or about as much as in 1913, but the ocean fishery now yields about 81 percent of the total catch.

In recent years emphasis has been placed on rebuilding and modernizing the fishing fleet, putting it in the best possible condition, and equipping it with the newest instruments. Large vessels are now mostly used, and they freeze the catches, pack them in boxes, and make fish meal out of what is left.

It is a great problem to maintain, and still more difficult to attain, an increase in the catch of fish. The country's industries, with their many dams, power stations, and factories on all the great rivers, to a large extent, destroy the fishery stocks and disturb the passage of fish. In inland waters the fishery also encounters the limits of overfishing. In the Sea of Azov, for example, the fishery there formerly accounted for about 230,000 metric tons annually, but now only about 200,000 metric tons. The same can be said of the Caspian Sea where the total catch in 1940 was 351,000 metric tons, contrasted to 340,000 metric tons today. But in reservoirs and inland lakes, the fishery has increased considerably with the help of fish culture. Fish ladders have also been built in all places where possible. They are of various types according to the circumstances and requirements of the various kinds of fish. Good results have resulted from many of them. For example, Soviet scientists promise more sturgeon in Soviet's great rivers in peacetime than there were before all the great dams were built. Salmon culture has given good results in the Kura and Kuban Rivers.

Formerly, most of the catch was salted, but now over 50 percent is frozen and much of it is also canned. The total production of salt fish is now less than before World War I when it was 340,000 tons (nearly half of the total catch). Now it is about 300,000 tons--only a small percentage of the total catch. The consumption of fish, which was formerly about 6 kilograms (13.2 lbs.) a year per capita, has now increased to over 12 kilograms (26.4 lbs.).

In recent years the Soviets have emphasized the building up of a fleet of large trawlers which can carry on many types of fisheries at sea far from the mother country. These are specially applicable to the fisheries in the Atlantic Ocean on the great banks of Newfoundland, Georges Bank, and Greenland, and off the West African coast. The fleet is divided into two principal categories: factoryship trawlers and fleet expeditions. The last category includes many trawlers accompanied by a mothership. They supply the transporting ship with catches of round fish, or dressed or drawn fish, and receive fuel and water from it. In contrast, the large factoryship trawlers fish and fully prepare their own catches until they have a complete load, and then sail with their catches to Soviet ports. There are two principal types of those trawlers:

1. Factoryship Trawlers: These vessels fish in the Northwest Atlantic, on the Newfoundland Banks, and Georges Bank. They are stern trawlers with freezers, are about 3,600 metric tons, have 2,000-hp. engines, storage for 750 metric tons, crews of 90 to 100 men, and can stay at sea for 90 days. They have freezing equipment that can quick-freeze 30-35 metric tons of fish fillets a day, and also filleting machines with a production capacity of 10-15 tons per day. They also have fish meal processing equipment which manufactures about 4 tons per day. In addition, those vessels have canning equipment, which is used principally to produce products from fish livers. The annual catch of one of those trawlers is 6,000 to 7,000 metric tons. They usually use trawls made of synthetic fiber.

2. After some research with fishing on Africa's west coast, the Soviets found that they could do better with another type of vessel. For this fishery, they have built stern trawlers of 2,900 metric tons with storage capacities of 560 metric tons, crews of 60-70 men, and freezing apparatuses that can daily freeze 30-35 metric tons. They have no filleting machines. They fish principally for sardines, mackerel, and other species, such as carangids. Both the factoryship trawlers and stern trawlers use synthetic fiber trawls with large, vertical openings. Under good conditions, they can take 20-25 metric tons per 2-hour tow. Tropic trawlers use midwater trawls which can be fished in any depth.

3. In the North Pacific Ocean, the Northeast Atlantic Ocean, and Barents Sea, the So-

## U. S. S. R. (Contd.):

viets use principally trawlers of the "Okean" type. They are of medium size: 650 metric tons with a capacity of 150 metric tons, 26-man crews, and can fish 30 to 35 days before returning to port. They often accompany a mothership which takes the catch and supplies them with fuel and water. They are equipped with trawls, purse seines, and gill nets. During autumn and over the winter, for example, they fish a great deal with gill nets in the region between Iceland and Norway; in the spring and summer they fish with trawls in the Barents Sea, Georges Bank, or on the Newfoundland Banks. These trawlers are not particularly well equipped. For example, they lack freezing equipment. The Soviets are now beginning to build new trawlers for this fishery which are somewhat larger.

4. "Maiak" Type Trawlers: These vessels are 1,350 metric tons, have a capacity of 200 metric tons, 800 hp. engines, 30-man crews, and can stay at sea 50 to 55 days. This type trawler has freezing equipment that can freeze 6-7 tons daily. They can travel at 11-13 knots and are equipped with Russian hydroacoustic instruments of both horizontal and vertical types. They have mostly trawled at depths of 200-300 meters (656-984 feet), down to 400 meters (1,312 feet), and still fish mostly at those depths, but they have now also begun to trawl at 400-600 meters (1,312-1,969 feet), and in the Pacific Ocean down to 700 meters (2,297 feet), with good results.

Among new fishing gear is the Soviet mid-water trawl, which has given good results.

Fishing off the West African coast is shown to be profitable, and the fishery is beginning to be pursued. Most of the catch is brought to Soviet ports and only a part is sold on the spot, for example in Ghana. Fishing with a pump and light has been tried for North Sea herring, but with a complete lack of success.

The object of the Soviet fisheries is not to make a profit, but instead, to satisfy the Soviet people's demand for food. Shipbuilding continues, and the catches bring a steady price fixed by the Government. The fluctuation in the fish markets in other places have no influence on the price of fish in the Soviet Union.

Fishermen are paid in the following way:

1. Fixed "normal" pay, which is calculated on the basis of the vessel's filling its production goal.
2. A bonus for those vessels with a catch that exceeds the goal.
3. For those whose catch is disappointing, there is a guaranteed minimum share which is somewhat lower than the normal pay.

The Soviet fisheries are now approaching the established goal--to reach a yearly total catch of about 5 million metric tons--but the members of the Soviet Fishery Board think that the Soviet people really need about 7 million metric tons.

Note: Translation from Norwegian by Leslie W. Scattergood of article "Sovjetsamveldets fiskerier" (Soviet Fisheries), which appeared in *Fiskets Gang*, 50 Mårgang, nr. 7 (February 13, 1964), pp. 119-120.



## United Kingdom

### WORLDWIDE TARIFF REDUCTION ASKED BY BRITISH PRIME MINISTER:

The British Prime Minister confirmed in a speech April 9, 1964, that Britain's trade policies are aimed at achieving worldwide reductions in tariff barriers. The Prime Minister's remarks were made in London in the opening address to the European Purchasing Conference, which is composed of buyers from most European countries as well as from the United States, Canada, India, and Japan. The Prime Minister was reported to have said that the United Kingdom will have free trade by 1966 with all countries in the European Free Trade Association (EFTA). He noted that at present there are no such advantages for British trade in the European Economic Community (EEC), but nevertheless Britain's exports to the EEC are steadily increasing. On the Kennedy Round of tariff negotiations under the General Agreement on Tariffs and Trade, the Prime Minister was reported to have stated that Britain would go into the talks seeking a 50-percent general reduction in tariffs with a minimum of exceptions. (United States Embassy, London, April 18, 1964.)

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### BRITISH FISHING INDUSTRY:

The British fishing industry employs some 24,000 full-time and 6,000 part-time fishermen.

## United Kingdom (Contd.):

The principal fishing ports in England and Wales are Hull, Grimsby, Fleetwood, Milford Haven, and Lowestoft for white fish (cod, haddock, plaice, turbot, and sole) and Great Yarmouth and Lowestoft for herring.

The white fish fleet is made up of three main groups--the distant-water, the near- and middle-water, and the inshore vessels. The distant waters are those off Iceland, Greenland and the north coast of Norway, and the Barents Sea. The middle-water grounds lie around the Faroe Islands. The near-water grounds are in the North Sea, the Irish Sea, and the coastal areas around Britain. Herring fishing grounds are mainly within 60 miles of land.

Distant-water vessels (there are about 300 of them) are more than 140 feet long and make voyages of from 17 to 23 days; middle-water vessels are less than 140 feet long and their voyages can last from several days up to 2 weeks. Britain has more than 450 near-water and middle-water vessels. The capital invested in British fishing vessels is some £55 million (US\$154 million) and the public buy fish to the value of more than £100 million (\$280 million) a year.

The catch is usually distributed through wholesalers at the ports, who buy at auctions and sell to inland wholesalers. (Billingsgate Market, London, which handles more than 300 tons of fish a day, is the largest inland wholesale distributing center for fish in Britain, although other large cities have central fish markets.) Sixty special express fish trains transport the catch daily from the ports to inland centers, and increasing use is made of truck transport.

Every village, town, and city of Britain has fresh fish available within 24 hours of being landed. Retail sales are handled by some 30,000 fishmongers and about the same number of fish friers. Purchases by fish friers account for roughly one-third of the value of landings of white fish.

Frozen packaged fish--sold by other shops as well as fishmongers--is rapidly increasing in popularity and accounts for about 20 percent of all fish sold in Britain. (Commercial Fishing, March 1964.)

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## PRODUCTION OF FROZEN PROCESSED FISHERY PRODUCTS, 1963:

British production of frozen processed fishery products in 1963 amounted to 58,062 long tons, only 263 tons (or 0.5 percent) more than the previous year but up 3.4 percent from 1961. This is revealed in a report issued by the White Fish Authority, London.

Of the 1963 production, 27,445 tons were packed in bulk or institutional packs and 30,617 tons were packed in consumer packs. While the quantity put up in bulk or institutional packs in 1963 was 18.7 percent less than the previous year, the quantity packed in consumer packs increased 27.4 percent.

In addition to the domestic production, 18,748 tons were imported (10,451 tons in bulk or institutional packs and 8,297 in consumer packs) in 1963, somewhat less than in 1962.

British Production of Frozen Processed Fishery Products as Reported by the White Fish Authority				
Year	Fish Used	Amount Produced		
		Institutional Packs	Consumer Packs	Total
(Long Tons)				
1963	129,000	27,445	30,617	58,062
1962	128,442	33,763	24,036	57,799
1961	127,020	29,996	26,161	56,157
1960	116,500	29,930	22,487	52,417

Home market sales of 73,901 tons in 1963 were up 17.0 percent from the previous year. The greater increase from 1962 was in home market sales of consumer packs (up 22.5 percent); sales of bulk or institutional packs were up 12.5 percent.

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## BRITISH FIRM PLANS TO EXPAND FLEET OF REFRIGERATED STERN TRAWLERS:

A British fisheries company has announced plans to order eight additional stern trawlers all of which will be equipped to freeze fish at sea. When completed the vessels will be assigned to Grimsby and Hull where they will serve as replacements for older vessels in the British company's fleet of 61 distant-water trawlers. (Only 16 vessels in that fleet are over 10 years old.)

The first of the new group of stern trawlers will be scheduled for delivery in June 1965.

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## United Kingdom (Contd.):

**NEW MACHINE CUTS FISH-DRYING PROCESS TO 30 HOURS:**

A machine that cuts the process of drying fish from 6 weeks to 30 hours has been developed at the British Government Torry Research Station in Aberdeen, Scotland. Since the machine can be used on board fishing vessels at sea, it will enable trawlers to operate in unexploited fishing grounds of the South Atlantic and dry their catches at sea.

Working in cooperation with the Torry Research Station, a Scottish shipyard has designed a new type of trawler to carry the drying machine. The vessel will be about 310 feet long--only slightly larger than conventional deep-sea trawlers. (Commercial Fishing, March 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 112.

**Viet-Nam****SHRIMP EXPORTS TO JAPAN UP IN 1963:**

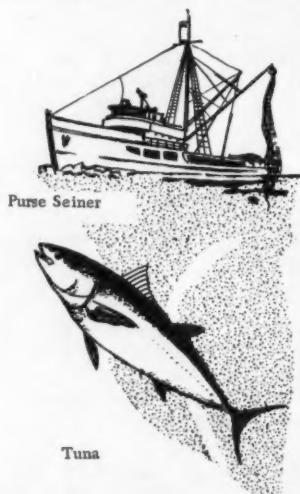
Viet-Nam's shrimp exports to the United States in 1963 were valued at US\$32,000, and were about unchanged from those of the previous year. In the same year, however, Japan's purchases of shellfish products from that country (769,000 pounds), particularly shrimp, were ten times greater than a year earlier and were valued at \$300,000. By increasing its purchases of spiny lobsters, mollusks, and shrimp, Japan replaced Hong Kong as Viet-Nam's best fishery customer. (United States Embassy, Saigon, May 6, 1964.)

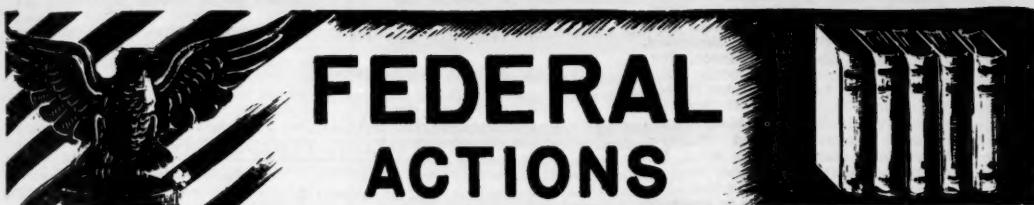
**TUNA**

Tuna are wide-ranging inhabitants of the open sea; some species cross the oceans in their movements. Little note was paid them until 1903, when the sardine failed to

appear in California waters. Today, more tuna are taken by United States fishermen than any other food fish and only the shrimp and salmon fisheries are more valuable. For many years, American fishermen in the famed tuna clippers pursued the fish along the coasts of the Americas from southern California to far below the Equator. At its peak in 1951, the clipper fleet numbered 228 boats. In the late 1950's, however, a revolution occurred in the United States tuna fishery as clipper after clipper converted to the more efficient purse seiner. This was possible because of the introduction of nylon seines and the development of the power block to handle the great nets. Four kinds of tuna--yellowfin, skipjack, albacore, and bluefin--and a tunalike fish, the bonito, are taken by our fishermen, largely off Central and South America. Recent landings have averaged nearly 300 million pounds, worth \$35 to \$40 million ex-vessel. From those landings and imported frozen tuna, West Coast processors annually put up a tuna pack worth more than \$140 million. For many years, California processors have led the world in the canning of tuna.

--Conservation Note 15, "Commercial Fisheries of the Pacific Coast,"  
Fish and Wildlife Service, U. S. Department of the Interior,  
Washington, D. C. 20240.





# FEDERAL ACTIONS

**Department of Commerce**
**AREA REDEVELOPMENT ADMINISTRATION**
**INDUSTRIAL LOAN TO MARYLAND  
PET FOOD FIRM APPROVED:**

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce has approved an industrial loan of \$461,500 to help Custom Pet Food Packers, Inc., establish a plant at Princess Anne, Md., for the canning of dog and cat food. While cereals, beef, and poultry byproducts will constitute the principal ingredients of the pet food, the manufacturer anticipates using 48 tons of "trash" fish per day in the products.

The loan funds will be used to buy and improve land, to construct buildings, and to purchase machinery and equipment. The total cost of the project will be \$710,000. Production at the plant will require 123 workers, and in addition it is estimated that 36 directly related jobs will be generated in fishing and supply industries.

\* \* \* \* \*

**SURVEY OF FISHERIES POTENTIAL IN  
CARTERET COUNTY, NORTH CAROLINA:**

A technical assistance project to survey the expansion potential of the fisheries industry in Carteret County, N. C., has been approved by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce.

The 16-months research project is to be conducted by a firm in Morehead City, N. C. The U. S. Bureau of Commercial Fisheries will supervise the contract work. The technical assistance project will include: (1) a survey of fishery resources to determine present sufficiency and the potential for future development; (2) establishment of an experimental pilot-plant operation using modern techniques to produce new products for consumer tests to determine their acceptance

and marketability; and (3) a labor-skill survey to determine present skills and possible new requirements.

On the basis of the study results, recommendations will be made as to the most promising lines for expansion of existing seafood processing plants as well as the potential for new enterprises. The total cost of the fishery research project will be approximately \$40,000. ARA will finance \$36,000 of that amount with Carteret County contributing the balance.


**Department of Health,  
Education, and Welfare**
**FOOD AND DRUG ADMINISTRATION**
**NEW FOOD ADDITIVE REGULATION  
CONCERNING KELP:**

A regulation prescribing the use of kelp as a source of iodine in foods for special dietary use was issued by the Commissioner of Food and Drugs, effective April 24, 1964, as an amendment to food additive regulations (Title 21, Code of Federal Regulations, Part 121).

The new regulation as it appeared in the Federal Register, April 24, 1964, follows:

**Title 21—FOOD AND DRUGS**
**Chapter I—Food and Drug Adminis-  
tration, Department of Health, Edu-  
cation, and Welfare**
**SUBCHAPTER B—FOOD AND FOOD PRODUCTS**
**PART 121—FOOD ADDITIVES**
**Subpart D—Food Additives Permitted  
in Food for Human Consumption**
**KELP**

The Commissioner of Food and Drugs, having evaluated the data in a petition

(FAP 411) filed by California Vegetable Concentrates, Inc., P.O. Box 149, Huntington Park, California; Diketan Laboratories, Inc., 9201 Wilshire Boulevard, Los Angeles, California; Kopco, Inc., Dock 1, Port Hueneme, California; Philip R. Park, Inc., Berth 42, Outer Harbor, San Pedro, California; S. O. Barnes & Sons, Inc., 17250 South Main Street, Gardena, California; and Thurston Laboratories, 3358 Glendale Road, Los Angeles, California, and other relevant material, has concluded that a food additive regulation should issue to prescribe the use of kelp as a source of iodine in foods for special dietary use. Therefore, pursuant to the provisions of the Federal Food, Drug, and Cosmetic Act (sec. 409 (c) (1), 72 Stat. 1786; 21 U.S.C. 348(c) (1)), and under the authority delegated to the Commissioner by the Secretary of Health, Education, and Welfare (21 CFR 2.90; 29 F.R. 471), the food additive regulations are amended by adding to Subpart D a new section reading as follows:

#### **§ 121.1149 Kelp.**

Kelp may be safely used as a source of iodine in foods for special dietary use when the amount of iodine so provided for daily intake does not exceed 0.15 milligram. The food additive kelp is the dehydrated, ground product prepared from *macrocystis pyrifera*.

Any person who will be adversely affected by the foregoing order may at any time within 30 days from the date of its publication in the *Federal Register* file with the Hearing Clerk, Department of Health, Education, and Welfare, Room 5440, 330 Independence Avenue SW., Washington 25, D.C., written objections thereto. Objections shall show wherein the person filing will be adversely affected by the order and specify with particularity the provisions of the order deemed objectionable and the grounds for the objections. If a hearing is requested, the objections must state the issues for the hearing. A hearing will be granted if the objections are supported by grounds legally sufficient to justify the relief sought. Objections may be accompanied by a memorandum or brief in support thereof. All documents shall be filed in quintuplicate.

**Effective date.** This order shall be effective on the date of its publication in the *FEDERAL REGISTER* (Sec. 409(c)(1), 72 Stat. 1786; 21 U.S.C. 348 (c) (1)).

Dated: April 20, 1964.

GEO. P. LARRICK, -  
Commissioner of Food and Drugs.



## **Department of the Interior**

### **FISH AND WILDLIFE SERVICE**

#### **BUREAU OF COMMERCIAL FISHERIES**

### **EASTERN PACIFIC YELLOWFIN TUNA FISHING REGULATIONS PROPOSED:**

Notice of proposed regulations concerning catch quota, open seasons, and closed seasons for yellowfin tuna; and restrictions on tuna imports were published in the *Federal Register*, May 9, 1964, by the U.S. Department of the Interior. The proposed regulations are to be issued under the authority contained in subsection (c) of section 6 of the Tuna Conventions Act of 1950, as added by the Act of October 16, 1962.

The notice provided that consideration would be given to any data, views, or arguments pertaining thereto which were submitted in writing to the Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, Terminal Island, Calif., by June 8, 1964.

A public hearing also was held at the United Portuguese Club, 2818 Addison Street, San Diego, Calif., May 23, 1964, when interested persons were given an opportunity to comment orally on the proposed regulations.

The proposed regulations as they appeared in the *Federal Register*, May 9, 1964, follow:

## **DEPARTMENT OF THE INTERIOR**

### **Fish and Wildlife Service**

#### **[ 50 CFR Parts 280, 281 ]**

### **EASTERN PACIFIC TUNA FISHERIES**

#### **Notice of Proposed Rule Making**

Notice is hereby given, pursuant to section 4(a) of the Administrative Procedure Act of June 11, 1946 (60 Stat. 237), and section 6(c) of the Tuna Conventions Act of 1950 (64 Stat. 778), as amended by the Act of October 15, 1962 (76 Stat. 923; 16 U.S.C. 955), that the Secretary of the Interior proposes to amend Title 50, Code of Federal Regulations, by adding a new Subchapter H—Eastern Pacific Tuna Fisheries, consisting of Part 280—Yellowfin Tuna and Part 281—Restrictions on Tuna Imports. The proposed regulations are set forth in tentative form below.

The proposed regulations are to be issued under the authority contained in subsection (e) of section 6 of the Tuna Conventions Act of 1950, as added by the Act of October 15, 1962. In accordance with the authority cited, after adoption of the regulations proposed as Part 280

and publication thereof in the *FEDERAL REGISTER*, such regulations are to become applicable to all vessels and persons subject to the jurisdiction of the United States on such date as the Secretary of the Interior shall prescribe, but in no event prior to an agreed date for the application by all countries whose vessels engage in fishing for species of fish covered by the Convention for the Establishment of an Inter-American Tropical Tuna Commission (1 U.S.T. 230), in the regulatory area on a meaningful scale of effective measures for the implementation of the Commission's recommendations applicable to all vessels and persons subject to their respective jurisdictions. Steps are being taken to reach agreement with the several countries whose fishermen participate in the tuna fisheries of the eastern Pacific Ocean looking toward July 1, 1964, as the date for the simultaneous application by all such countries of suitable conservation measures to be observed by their fishing vessels.

Prior to the final adoption of the proposed regulations, consideration will be given to any data, views, or arguments pertaining thereto which are submitted in writing to the Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, California, within the period of 30 days from the date of publication of this notice in the *FEDERAL REGISTER*. Interested persons will also be afforded an opportunity to comment orally on the proposed regulations at a public hearing to be held at United Portuguese Club, 2818 Addison Street, San Diego, California, beginning at 10:00 a.m., May 23, 1964. Any person who intends to present views orally at such hearing is requested to furnish in writing his name and the name of the organization he represents, if any, to the said Regional Director and not later than May 20, 1964.

Issued at Washington, D.C., and dated May 7, 1964.

JAMES K. CARR,

*Under Secretary of the Interior.*

#### SUBCHAPTER H—EASTERN PACIFIC TUNA FISHERIES

#### PART 280—YELLOWFIN TUNA

Sec.

- 280.1 Definitions.
- 280.2 Basis and purpose.
- 280.3 Catch limit.
- 280.4 Open season.
- 280.5 Closed season.
- 280.6 Tuna clearance certificates.
- 280.7 Reports and record keeping.
- 280.8 Persons and vessels exempted.

AUTHORITY: The provisions of this Part 280 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

##### § 280.1 Definitions.

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) *Convention.* The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(b) *Commission.* The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(c) *Director of Investigations.* The Director of Investigations, Inter-American Tropical Tuna Commission, La Jolla, California.

(d) *Bureau Director.* The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) *Regional Director.* The Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, 101 Seaside Avenue, Terminal Island, California.

(f) *Regulatory area.* All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines:

Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 130 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(g) *Yellowfin tuna.* Any fish of the species *Thunnus albacares* (synonym: *Neothunnus macropterus*).

(h) *Other tuna fishes.* Those species (and none other) of the family Scombridae which are known as:

(1) *Albacore*—*Thunnus alalunga* (synonym: *Thunnus germo*).

(2) *Bigeye*—*Thunnus obesus* (synonym: *Parathunnus sibi*).

(3) *Bluefin*—*Thunnus thynnus* (synonym: *Thunnus saliens*).

(4) *Skipjack*—*Euthynnus pelamis* (synonym: *Katsuwonus pelamis*).

(i) *Fishing vessel.* Every kind, type or description of watercraft subject to the jurisdiction of the United States (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting its catch of fish from fishing grounds.

(j) *Transport vessel.* Every kind, type or description of watercraft subject to the jurisdiction of the United States used or capable of being used exclusively to take on board on the high seas and transport to a port of the United States the catches of fishing vessels of the United States.

(k) *Person.* Individual, association, corporation or partnership subject to the jurisdiction of the United States.

(l) *Open season.* The time during which yellowfin tuna may lawfully be captured and taken on board a fishing vessel in the regulatory area without limitation on the quantity permitted to be retained during each fishing voyage. Unless otherwise specified, whenever time is stated in hours it shall be construed to refer to standard time in the area affected.

(m) *Closed season.* The time during which yellowfin tuna may not be taken or retained on board a fishing vessel in quantities exceeding the amounts permitted to be taken and retained as an incident to fishing for other tuna fishes.

##### § 280.2 Basis and purpose.

(a) At a special meeting held at Long Beach, California, on September 14, 1961,

the Commission recommended to the Governments of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16–18, 1962; at Panama City, Panama, April 16–17, 1963; and at San Diego, California, March 18–19, 1964; the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation in effecting the recommended conservation measures.

(c) At a meeting held at San Diego, California, on March 20, 1964, representatives of the Governments of Costa Rica, Ecuador, Japan, Mexico, and the United States of America gave assurances that beginning as of July 1, 1964, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in March 1964 for a yellowfin tuna conservation regime. Subsequent to March 20, 1964, the Governments of \_\_\_\_\_ and \_\_\_\_\_ gave like assurances. The several countries named are parties to the Convention or, not being parties, exercise jurisdiction over vessels which "engage in fishing for species covered by the Convention in the regulatory area on a meaningful scale, in terms of effect upon the success of the conservation program" within the purview of section 6(c) of the Tuna Conventions Act of 1950, as amended.

(d) The regulations in this part are designed to implement the Commission's

current and future applicable recommendations for the conservation of yellowfin tuna so far as they affect all vessels and persons subject to the jurisdiction of the United States.

#### § 280.3 Catch limit.

The annual limitation on the quantity of yellowfin tuna permitted to be taken from the regulatory area during the open season by the fishing vessels of all nations participating in the fishery will be fixed and determined on the basis of recommendations made by the Commission pursuant to paragraph 5 of Article II of the Convention. Upon approval by the Secretary of State and the Secretary of the Interior of the recommended catch limit, announcement of the catch limit thus established shall be made by the Bureau Director through publication of a suitable notice in the *FEDERAL REGISTER*. The Bureau Director, in like manner, shall announce any revision or modification of an approved annual catch limit which may subsequently enter into force.

#### § 280.4 Open season.

The open season for yellowfin tuna fishing shall begin annually at 12:01 a.m. of the first day of January and terminate at midnight on a date to be determined and announced as provided in § 280.5.

#### § 280.5 Closed season.

(a) Pursuant to authority granted by the Commission, the Director of Investigations maintains records of the catches of yellowfin tuna taken from the regulatory area and landed from time to time during the open season by the fishing vessels of all nations participating in the fishery. By taking into account the aggregate weight of the yellowfin tuna landings and the estimated additional quantities of yellowfin tuna expected to be taken by the fishing vessels of all nations operating in the regulatory area, the Director of Investigations will determine the date on which he deems the annual catch limit will be reached and will promptly notify the Bureau Director of such date. The Bureau Director shall announce the season closure date thus established by publication in the *FEDERAL REGISTER*. The closure date so announced shall be final except that if it shall at any time become evident to the Director of Investigations that the catch limit will not be reached by such date, he may substitute another date which shall be announced by the Bureau Director in like manner as provided for the date originally determined.

(b) Except as provided in paragraphs (c) and (d) of this section, after the date determined in the manner provided in this section for the closing of the yellowfin fishing season, the taking of yellowfin tuna shall be prohibited until the yellowfin tuna fishing season reopens on January 1 next following the close of the season.

(c) Any fishing vessel which has departed port to engage in yellowfin tuna fishing pursuant to a tuna clearance certificate last validated prior to the date of the closure of the yellowfin fishing season may continue to take and retain yellowfin tuna without restriction as to quantity until the fishing voyage has been completed by unloading in port or by transferring to a transport vessel the whole or any part of the fishing vessel's cargo of tuna.

(d) After the close of the yellowfin tuna fishing season as provided in this section, yellowfin tuna captured as an incident to fishing for other tuna fishes may be taken on board a fishing vessel and landed or transferred to a transport vessel in an amount not exceeding fifteen percent by weight of all tuna fishes landed or transferred by the fishing vessel.

(e) At any time during the closed season a transport vessel, without regard to the quantities of yellowfin or other tuna fishes possessed on board the transport vessel, may receive, possess and transport to a port of the United States yellowfin tuna lawfully taken and transferred by a fishing vessel on the high seas: *Provided*, That no yellowfin tuna in any amount may be transferred from a fishing vessel or be received on board a transport vessel during the closed season unless an officer authorized to enforce the regulations in this part is aboard the transport vessel for the purpose of inspecting all such transfers.

#### § 280.6 Tuna clearance certificates.

(a) Except as permitted by § 280.8, after the first day of July 1964, no person shall use a fishing vessel or transport vessel for the capture, retention, transportation, or landing of yellowfin tuna in any quantity from the regulatory area during the open season unless such vessel shall have first been registered and cleared for yellowfin tuna fishing or for transporting yellowfin tuna in conformity with the provisions of this section.

(b) The managing owner, master, or other person in charge of a fishing vessel or a transport vessel may register such vessel to engage in yellowfin tuna fishing or in transporting yellowfin tuna from the fishing grounds by furnishing, either by letter or on a form to be supplied by the Bureau of Commercial Fisheries, information specifying the names and addresses of the managing owner and master, respectively, of the vessel, and the name, official number, home port, and cargo capacity (in tons of frozen tuna) of the vessel. Such application shall be submitted to the Regional Director who shall, without charge, issue in the name of the fishing vessel or transport vessel a certificate evidencing its registration to engage in yellowfin tuna fishing or in transporting yellowfin tuna during the calendar year applied for. Each such certificate shall expire at the end of the calendar year during which it is issued and shall be replaced by a new certificate upon application made in like manner as prescribed for the original certificate. New certificates shall similarly be issued to replace lost or mutilated certificates.

(c) Except as provided in paragraph (f) of this section, not earlier than 48 hours prior to each departure from port to engage in fishing for or transporting yellowfin tuna during the open season for such tuna, the master or other person in charge of a fishing vessel or a transport vessel or the agent of such person shall present the vessel's tuna clearance certificate for validation. Validation of a tuna clearance certificate shall be accomplished in the manner specified in paragraph (d) of this section. Such validation shall terminate at the time of the first discharge thereafter of any part of the tuna taken on board during the

voyage authorized by the validated certificate.

(d) Validation of a tuna clearance certificate as required in paragraph (c) of this section shall, upon request and only during the open season on yellowfin tuna, be entered as an endorsement made by an authorized validating officer upon the certificate held by the fishing vessel or transport vessel. Authorized officers as listed below, and their authorized representatives, may perform the functions of a authorized validating officers:

(1) For vessels departing ports of the United States—

Regional Director, Pacific Southwest Region, Bureau of Commercial Fisheries, Terminal Island, California; and Regional Director, Pacific Northwest Region, Bureau of Commercial Fisheries, Arcade Building, Seattle, Wash.  
Officers of the United States Bureau of Customs,  
Officers of the United States Coast Guard,  
Officers and employees of the Commonwealth of Puerto Rico.

(2) For vessels departing foreign ports—

The officer-in-charge at each of the following United States Consular posts:  
Colombia: Barranquilla, Bogota, Buenaventura, and Cali.  
Chile: Antofagasta, Concepcion, Santiago, and Valparaiso.  
Costa Rica: Puntarenas and San Jose.  
Ecuador: Guayaquil and Quito.  
El Salvador: San Salvador.  
Guatemala: Guatemala.  
Mexico: Mexico, D.F., and Mazatlan.  
Nicaragua: Managua.  
Panama: Colon and Panama.  
Peru: Arequipa and Lima.

(e) As circumstances require, the Bureau Director from time to time shall revise the list of authorized validating officers by publishing appropriate changes in the *FEDERAL REGISTER*. In the event an authorized validating officer is not available in port at the time of impending departure of a fishing vessel on a fishing voyage, a validation of the nature required by paragraph (c) of this section may be obtained by letter or prepaid telegraphic communication.

(f) A validation by an authorized validating officer shall not be required for a vessel departing a foreign port in any case where the Bureau Director finds and publishes notice thereof in the *FEDERAL REGISTER* that the Government of the country in which the port is situated has in force conservation measures which are adequate to meet the objectives of this section, including the means for providing documentary evidence establishing the date of departure of the vessel to engage in fishing for or transporting yellowfin tuna.

(g) The tuna clearance certificate and validation endorsements thereon issued as provided in this section shall at all times be carried on board the vessel for which issued and such certificate, the vessel, and its cargo shall at all times be subject to inspection for the purposes of this part by officers authorized to enforce the provisions of this part.

#### § 280.7 Reports and record keeping.

The master or other person in charge of a vessel holding a tuna clearance certificate issued under this part shall—

(a) Keep an accurate log of all operations conducted from the vessel, entering therein for each day the date, noon position (stated in latitude and longitude or in relation to known physical features) and the estimated quantities (in short tons) of tuna fish by species which are taken on board the vessel: *Provided*, That the fishing record and bridge log maintained at the request of the Commission shall be deemed a sufficient compliance with this paragraph whenever the items of information specified herein are fully and accurately entered in such log.

(b) Report by radio at least once each calendar week during a fishing voyage conducted in the open season; such reporting to begin on a date to be announced by the Bureau Director through publication of a suitable notice in the *FEDERAL REGISTER* and to continue throughout the open season. Reports by radio shall be made directly or through a cooperating vessel to Radio Station WWD, La Jolla, California, 4415.8 kc or 8805.6 kc or by prepaid commercial radio message directed to the Director of Investigations. Radio reports shall be made between 0900 and 2400, P.S.T., and shall state the name of the fishing vessel and the cumulative estimated quantities, by species, of all tuna fish taken on board from week to week throughout the duration of the fishing voyage. Weekly reports containing all items of information required by this paragraph may be submitted to the Director of Investigations by the shore representative of the vessel master in lieu of the radio reports from the vessel.

(c) Furnish on a form supplied by the Bureau of Commercial Fisheries, immediately following the delivery or sale of a catch of tuna made by means of such vessel, a report, certified to be correct, giving the name and official number of the fishing vessel, the dates of commencement and conclusion of the fishing voyage and listing separately by species and weight in pounds or short tons, the gross quantities of each species of tuna fish so sold or delivered: *Provided*, That, at the option of the vessel master or other person in charge, a copy of the fish ticket, weigh-out slip, settlement sheet, or similar record customarily issued by the fish dealer or his agent may be used for reporting purposes, in lieu of the form supplied by the Bureau of Commercial Fisheries, if such alternate record is similarly certified and contains all items of information required by this paragraph: *Provided*, That any vessel landing its catch in California and reporting by means of a copy of the California fish ticket may indicate the California Fish and Game boat number in lieu of the vessel's official number. Such report shall be delivered or mailed to the Regional Director within 48 hours after the weigh-out has been completed.

#### **§ 280.8 Persons and vessels exempted.**

Nothing contained in §§ 280.2 to 280.7 shall apply to:

(a) Any person or vessel authorized by the Commission, the Bureau Director, or any State of the United States to engage in fishing for research purposes.

(b) Any vessel documented as a common carrier by the Government of the United States and engaged exclusively in the carriage of freight and passengers

(other than a transport vessel as defined in § 280.1(j)).

(c) Any vessel of less than ten gross tons.

(d) Any person or vessel engaged in sport fishing for personal use.

### **PART 281—RESTRICTIONS ON TUNA IMPORTS**

#### **Sec.**

- 281.1 Definitions.
- 281.2 Basis and purpose.
- 281.3 Species subject to regulation.
- 281.4 Species under investigation by the Commission.
- 281.5 Investigations authorized.
- 281.6 Publication of findings.
- 281.7 Proof of admissibility.
- 281.8 Removal of import restrictions.

**AUTHORITY:** The provisions of this Part 281 issued under sec. 6, 64 Stat. 778, as amended, 16 U.S.C. 955.

#### **No. 92—Pt. I—3**

#### **§ 281.1 Definitions.**

For the purposes of this part, the following terms shall be construed, respectively, to mean and to include:

(a) **United States.** All areas under the sovereignty of the United States, the Trust Territory of the Pacific Islands, and the Canal Zone.

(b) **Convention.** The Convention for the Establishment of an Inter-American Tropical Tuna Commission, signed at Washington, May 31, 1949, by the United States of America and the Republic of Costa Rica (1 U.S.T. 230).

(c) **Commission.** The Inter-American Tropical Tuna Commission established pursuant to the Convention.

(d) **Bureau Director.** The Director of the Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior.

(e) **Regulatory area.** All waters of the eastern Pacific Ocean bounded by the mainland of the Americas and the following lines:

Beginning at a point on the mainland where the parallel of 40 degrees north latitude intersects the coast; thence due west to the meridian of 125 degrees west longitude; thence due south to the parallel of 20 degrees north latitude; thence due east to the meridian of 130 degrees west longitude; thence due south to the parallel of 5 degrees north latitude; thence due east to the meridian of 110 degrees west longitude; thence due south to the parallel of 10 degrees south latitude; thence due east to the meridian of 90 degrees west longitude; thence due south to the parallel of 30 degrees south latitude; thence due east to a point on the mainland where the parallel of 30 degrees south latitude intersects the coast.

(f) **Yellowfin tuna.** Any fish of the species *Thunnus albacares* (synonymy: *Neothunnus macropterus*).

(g) **Other tuna fishes.** Those species (and none other) of the family Scombridae which are known as:

(1) Albacore—*Thunnus alalunga* (synonymy: *Thunnus germeo*).

(2) Bigeye—*Thunnus obesus* (synonymy: *Parathunnus sibilis*).

(3) Bluefin—*Thunnus thynnus* (synonymy: *Thunnus saliens*).

(4) Skipjack—*Euthynnus pelamis* (synonymy: *Katsuwonus pelamis*).

(h) **Fishing vessel.** Every kind, type or description of watercraft (other than purse seine skiffs) used in or outfitted for catching or processing fish or transporting fish from fishing grounds.

(i) **Person.** Individual, association, corporation or partnership.

#### **§ 281.2 Basis and purpose.**

(a) At a special meeting held at Long Beach, California on September 14, 1961, the Commission recommended to the Governments of Costa Rica, Ecuador, Panama, and the United States of America, parties to the Convention, that they take joint action to limit the annual catch of yellowfin tuna from the eastern Pacific Ocean by fishermen of all nations during the calendar year 1962. This recommendation was made pursuant to paragraph 5 of Article II of the Convention on the basis of scientific investigations conducted by the Commission over a period of time dating from 1951. The most recent years of this period were marked by a substantial increase in fishing effort directed toward the yellowfin tuna stocks, resulting in a rate of exploitation of these stocks greater than that at which the maximum average sustainable yield may be obtained. The Commission's recommendation for joint action by the parties to regulate the yellowfin tuna fishery has as its objective the restoration of these stocks to a level of abundance which will permit maximum average sustainable catch and the maintenance of the stocks in that condition in the future.

(b) At annual meetings held at Quito, Ecuador, May 16-18, 1962; at Panama City, Panama, April 16-17, 1963; and at San Diego, California, March 18-19, 1964; the Commission affirmed its earlier conclusions regarding the need for regulating the yellowfin tuna fishery in the eastern Pacific Ocean and at each meeting recommended to the parties to the Convention that they take joint action to:

(1) Establish a prescribed tonnage limit on the total catch of yellowfin tuna by the fishermen of all nations during each calendar year from an area of the eastern Pacific Ocean defined by the Commission;

(2) Establish open and closed seasons for yellowfin tuna under prescribed conditions;

(3) Permit the landing of not more than fifteen percent (15%) by weight of yellowfin tuna among the tuna taken on a fishing trip made after the close of the yellowfin tuna fishing season; and

(4) Obtain from governments not parties to the Convention, but having vessels which operate in the fishery, cooperation in effecting the recommended conservation measures.

(c) At a meeting held at San Diego, California, on March 20, 1964, representatives of the Government of Costa Rica, Ecuador, Japan, Mexico, and the United States of America gave assurances that beginning as of July 1, 1964, each country would apply to all vessels and persons subject to its jurisdiction effective measures for the implementation of the recommendations made by the Commission in March 1964 for a yellowfin tuna conservation regime. Subsequent to March 20, 1964, the Governments of \_\_\_\_\_ and \_\_\_\_\_ gave like assurances. The several countries named are parties to the Convention or, not being parties, exercise jurisdiction over vessels which "engage in fishing for species covered by the Convention in the regulatory area on a meaningful scale,

in terms of effect upon the success of the conservation program," within the purview of section 6(c) of the Tuna Conventions Act of 1950, as amended.

(d) In conformity with the provisions of section 6(c) of the Act and simultaneously with the adoption of the regulations in this part, the Secretary of the Interior has made effective Part 280 of this title for the purpose of carrying out the current and future recommendations of the Commission for the conservation of yellowfin tuna in the regulatory area so far as such recommendations affect all vessels and persons subject to the jurisdiction of the United States.

(e) The yellowfin tuna stocks recommended for regulation by the Commission constitute a significant part of an international high seas fishery in which the vessels of a number of countries are engaged in varying degrees. Since some of the countries are not parties to the Convention and, therefore, have no applicable treaty obligations to fulfill, the achievement of the conservation objectives with respect to the tuna resources of the eastern Pacific Ocean is dependent upon international cooperative efforts to implement the Commission's recommendations. With a view toward encouraging effective cooperation on the part of such countries, the Tuna Conventions Act of 1950, as amended, directs that restrictions be established on the importation of certain tuna fish from any country which shall fail to take action to prevent the occurrence of certain proscribed activities. Thus, section 6(c) of the Act provides that the Secretary of the Interior, with the concurrence of the Secretary of State, shall promulgate regulations—

(1) To prohibit the entry into the United States, from any country where the vessels of such country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area; and

(2) To prohibit entry into the United States, from any country, of fish in any form of those species which are subject to regulation pursuant to a recommendation of the Commission and which were taken from the regulatory area by vessels other than those of such country in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission.

(f) Section 6(c) of the Act further provides that "in the case of repeated and flagrant fishing operations in the regulatory area by the vessels of any country which seriously threaten the achievement of the objectives of the Commission's recommendations, the Secretary of the Interior, with the concurrence of the Secretary of State, may, in his discretion, also prohibit the entry from such country of such other species of tuna, in any form, as may be under investigation by the Commission and which were taken in the regulatory area."

(g) The regulations in this part are designed to implement the provisions of section 6(c) of the Act with respect to

import controls and to prescribe procedures for the establishment of restrictions on imports of tuna whenever such action shall be deemed warranted.

#### **§ 281.3 Species subject to regulation.**

The species of fish currently subject to regulation pursuant to a recommendation of the Commission within the meaning of section 6(c) of the Act is yellowfin tuna.

#### **§ 281.4 Species under investigation by the Commission.**

The species of fish currently under investigation by the Commission within the meaning of section 6(c) of the Act are yellowfin tuna, skipjack tuna, and bigeye tuna.

#### **§ 281.5 Investigations authorized.**

(a) The Bureau Director shall cause to be made from time to time such inquiries and investigations as may be necessary to keep himself and other persons concerned currently informed regarding the nature and effectiveness of the measures for the implementation of the Commission's recommendations which are being carried out by countries whose vessels engage in fishing within the regulatory area. In making a finding as to whether or not a country is condoning the use of vessels in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission, the Bureau Director shall take into account, among such other considerations as may appear to be pertinent in a particular case, the following factors:

(1) Whether or not the country provides or causes to be provided to the Commission pertinent statistics on a timely basis.

(2) Whether or not the country has in force conservation measures applicable to its own fishermen adequate for the implementation of the Commission's recommendations.

(3) Whether or not the country has in force measures for the control of landings in its ports of species subject to regulation which are taken in the regulatory area by fishermen of other countries contrary to the Commission's conservation recommendations.

(4) Whether or not the country, having put conservation measures into effect, takes reasonable action to enforce such measures.

(5) The number of vessels of the country which conduct fishing operations in the regulatory area.

(6) The quantity of species subject to regulation taken from the regulatory area by the country's vessels contrary to the Commission's conservation recommendations and its relationship to (1) the total quantity permitted to be taken by the vessels of all countries participating in the fishery and (ii) the quantity of such species sought to be restored to the stocks of fish pursuant to the Commission's conservation recommendations.

(7) Whether or not repeated and flagrant fishing operations in the regulatory area by the vessels of the country seriously threaten the achievement of the objectives of the Commission's recommendations.

(b) Any person who shall have reason to believe that the vessels of any country are being used in the conduct of fishing operations in the regulatory area in such manner or in such circumstances as would tend to diminish the effectiveness of the conservation recommendations of the Commission or that other acts within the purview of the import control provisions of section 6(c) of the Tuna Conventions Act of 1950, as amended, are occurring or are likely to occur, may communicate his belief to the Bureau Director. Every such communication shall contain or be accompanied by a full statement of the reasons for the belief, including a detailed description of such specific acts or events as may support the belief, and such other pertinent facts as may indicate a need for instituting an investigation as authorized in this part.

(c) Upon receipt by the Bureau Director of any communication submitted pursuant to paragraph (b) of this section and found to comply with the requirements of that paragraph, the Bureau Director promptly shall cause such investigation to be made as appears to be warranted by the circumstances of the case. In conducting such investigation the Bureau Director or his designated representative shall consider any representations offered by foreign interests, importers, brokers, domestic producers, or other interested persons. Unless good cause to the contrary shall exist, every such investigation shall be completed within 60 days following receipt of the communication.

#### **§ 281.6 Publication of findings.**

If it shall be determined on the basis of § 281.5 that species of fish subject to regulation or under investigation by the Commission, as the case may be, are ineligible for entry into the United States from a particular country pursuant to the provisions of section 6(c) of the Act, the Bureau Director, with the approval of the Secretary of the Interior and the Concurrence of the Secretary of State, when required by law, shall publish a finding to that effect in the *FEDERAL REGISTER*. Effective upon the date of publication of such finding in the *FEDERAL REGISTER*, every shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry either directly or indirectly from the country named in the finding shall be denied entry unless it shall be established by satisfactory proof pursuant to § 281.7 that a particular shipment of such fish is not ineligible for entry: *Provided*, That entry shall not be denied and no such proof shall be required for any such shipment which, on the date of such publication, was in transit to the United States on board a vessel operating as a common carrier.

#### **§ 281.7 Proof of admissibility.**

For the purposes of § 281.6 of this part and section 6(c) of the Tuna Conventions Act of 1950, as amended, a shipment of fish in any form of the species under regulation or under investigation by the Commission offered for entry, directly or indirectly, from a country named in a finding published under such § 281.6 shall be deemed to be eligible for entry if the shipment is accompanied by a certificate of eligibility, executed in the form and manner set forth below, certi-

eying that the tuna in the shipment are not of the species specified in the published findings or, if of such species, were not taken in the regulatory area. The required certificate of eligibility must be executed by a duly authorized official of the country named in the published finding and the certificate must be authenticated with respect to the signature and official position of the person executing the same by a consular officer or consular agent of the United States.

#### CERTIFICATE OF ELIGIBILITY

I, \_\_\_\_\_, an authorized officer of the Government of \_\_\_\_\_, certify that the shipment of tuna fish accompanied by this certificate, consisting of \_\_\_\_\_ (Quantity)

in \_\_\_\_\_ (Species) (Number and kind of packages or containers) bearing the following marks and numbers \_\_\_\_\_:

(a) Contains no fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended.

(b) Contains fish of the species prohibited entry into the United States by virtue of a finding of ineligibility published under regulations issued pursuant to section 6(c) of the Tuna Conventions Act of 1950, as amended, but that such fish were caught in the waters of \_\_\_\_\_.

(Identify area or areas in which fish were taken)  
by vessels subject to the jurisdiction of \_\_\_\_\_, and that none of the said fish (Country) was taken in any part of the eastern Pacific Ocean subject to conservation regulations pursuant to recommendations of the Inter-American Tropical Tuna Commission.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Address)

[This certificate must be accompanied by a certificate of authentication executed by a consular officer or consular agent of the United States.]

**§ 281.8 Removal of import restrictions.**  
Upon a determination by the Bureau Director that the conditions no longer exist which warranted the imposition of import restrictions against the country named in the finding published pursuant to § 281.6, the Bureau Director, with the approval of the Secretary of the Interior, shall publish a finding to such effect in the **FEDERAL REGISTER**. Effective upon the date of publication of such finding, the prior existing import restrictions against the country designated therein shall terminate; *Provided*, That for a period of one year from such date of publication every shipment of fish in any form of the species subject to regulation or under investigation by the Commission shall continue to be denied entry unless the shipment is accompanied by a certification executed by an authorized official of the country of export and authenticated by a consular officer or consular agent of the United States, certifying that no portion of the shipment is comprised of fish which are of species under regulation and which were prohibited from entry under the prior existing import restrictions.



## Office of Emergency Planning

### ALASKA AND A CALIFORNIA COUNTY DECLARED MAJOR DISASTER AREAS:

Two Notices of Major Disaster dated May 1, 1964, by the Office of Emergency Planning concerning the States of Alaska and California as a result of the earthquake beginning March 27, and its adverse consequences, were published in the **Federal Register** of May 7, 1964. Under the Act of September 30, 1950, Federal assistance to States and local governments is warranted in major disasters.

The Director of the Office of Emergency Planning has determined the entire State of Alaska to have been adversely affected, and has also determined that Del Norte County in California was affected by seismic sea waves of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to supplement State and local efforts.

The Notices as published in the May 7, **Federal Register** follow:

## OFFICE OF EMERGENCY PLANNING

### ALASKA

#### Notice of Major Disaster

Pursuant to the authority vested in me by the President under Executive Order 10427 of January 16, 1953, Executive Order 10737 of October 29, 1957, and Executive Order 11651 of September 27, 1962 (18 F.R. 407, 23 F.R. 5799, 27 F.R. 9683); Reorganization Plan No. 1 of 1958, Public Law 85-763, and Public Law 87-296; by virtue of the Act of September 30, 1950, entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" (42 U.S.C. 1855-1855g), as amended; notice is hereby given of a declaration of "major disaster" by the President in his letter to me dated March 28, 1964, reading in part as follows:

I hereby declare a major disaster in those areas of Alaska adversely affected by the earthquake beginning on March 27.

I do hereby determine the entire State of Alaska to have been adversely affected by the catastrophe declared a major disaster by the President in his declaration of March 28, 1964.

Dated: May 1, 1964.

## CALIFORNIA

#### Notice of Major Disaster

Pursuant to the authority vested in me by the President under Executive Order 10427 of January 16, 1953, Executive Order 10737 of October 29, 1957, and Execu-

tive Order 11051 of September 27, 1962 (18 F.R. 407, 22 F.R. 8789, 27 F.R. 9683); Reorganization Plan No. 1 of 1958, Public Law 85-763, and Public Law 87-296; by virtue of the Act of September 30, 1950, entitled "An Act to authorize Federal assistance to States and local governments in major disasters, and for other purposes" (42 U.S.C. 1855-1855g), as amended; notice is hereby given of a declaration of "major disaster" by the President in his letter to me dated April 1, 1964, reading in part as follows:

I have determined the damage in Del Norte County, California, adversely affected by seismic sea waves beginning on or about March 27, 1964, to be of sufficient severity and magnitude to warrant disaster assistance by the Federal Government to supplement State and local efforts.

Dated: May 1, 1964.

EDWARD A. McDERMOTT,  
Director,  
Office of Emergency Planning.



## United States Court of Appeals for the Fifth Circuit

### FISHERMEN CONSIDERED INDEPENDENT CONTRACTORS FOR TAX PURPOSES:

On March 3, 1964, in the tax refund case, United States v. Crawford Packing Company, the United States Court of Appeals for the Fifth Circuit upheld a ruling that captains and fishermen aboard shrimp vessels who work on a share basis are independent contractors for Federal employment tax and income withholding tax purposes. The ruling had been handed down January 23, 1962, by a Judge in the United States District Court for the Southern District of Texas. The District Court had ruled that the Government did not overcome Crawford's clear showing that the fishermen were free from direction and control of their fishing activities and that their earnings were dependent solely upon their skill, initiative, weather, and good fortune.

The decision only affects the liability of the vessel owners for Federal employment and income withholding taxes. It does not relieve them from liability for injuries to fishermen, nor interfere with the ancient rights of fishermen to maintenance and cure, nor any rights under the Jones Act.

**Editor's Note:** The decision by the Court of Appeals for the Fifth Circuit in the Crawford Packing Company case appears to be in conflict with the decision of December 6, 1963, by the Court of Appeals for the First Circuit

which upheld a ruling that fishing vessel crews and captains who operate under the "share" system are considered employees for Federal tax purposes.

Note: See Commercial Fisheries Review, Jan. 1964 p. 79, July 1963 p. 107, Aug. 1962 p. 95, and May 1962 p. 78.



## Eighty-Eighth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and



allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

**ALASKA DISASTER:** Senator Gruening from the floor of the Senate May 21, 1964 (Congressional Record, pages 11170-11171) pointed out that: ". . . I have been urging for some time now that the Administrator of the Small Business Administration, . . . lower the interest rate on disaster loans to Alaska victims to three-fourths of 1 percent--the same amount charged to foreign borrowers under the foreign aid program. . . ." The latest addition to the list of supporters for the idea is the executive council of the AFL-CIO, which on May 20 adopted a resolution supporting it. The Senator requested that the resolution adopted by the AFL-CIO council be printed in the Record.

**ALASKA OMNIBUS ACT AMENDMENTS:** H. Rep. 1410, Amending the Alaska Omnibus Act (May 14, 1964, report from the Committee on Interior and Insular Affairs, House of Representatives, 88th Congress, 2nd Session), 6 pp., printed. The Committee recommended passage (with amendments) of H.R. 11037, to amend the Alaska Omnibus Act, as amended, to increase by \$23.5 million the amount authorized to be appropriated for grants to assist the State of Alaska to assume burdens which were borne by the Federal Government while it was a territory and to extend to June 30, 1966, the period for which such grants may be made, and to extend by two years the time during which the Federal Government may continue to provide in Alaska certain services that normally belong to a State and during which property used for providing such services may be transferred to the State. Contains the purpose, need, committee amendment, cost, executive recommenda-

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tion, committee recommendation, and changes in existing law.

On May 18, 1964, the House passed S. 2772 (in lieu of H. R. 11037), to amend the Alaska Omnibus Act authorizing an additional grant of \$23.5 million to the State of Alaska for earthquake recovery purposes. This action cleared the bill for the President's signature.

On May 27, 1964, the President signed S. 2772 into law (P. L. 88-311).

On May 27, 1964, a communication was received from the President containing a draft of proposed legislation to amend the Alaska Omnibus Act to provide assistance to Alaska for reconstruction of damage by the earthquake last March. Referred to House Committee on Interior and Insular Affairs and Senate Committee on Public Works.

S. 2881 (Bartlett et al) introduced in the Senate and H. R. 11438 (Rivers) introduced in the House on May 28, 1964, bills to amend the Alaska Omnibus Act to provide assistance to the State of Alaska for the reconstruction of areas damaged by the earthquake of March 1964 and subsequent seismic waves, and for other purposes; referred to the Senate and House Committee on Interior and Insular Affairs. Senator Bartlett's descriptive remarks when he introduced the bill appear in that day's Congressional Record (pages 11779-11783).

On June 3, 1964, Senator Gruening spoke from the floor of the Senate and inserted in the Congressional Record (pages 12159-12163), the statement of the Attorney General of Alaska before the Senate Interior and Insular Affairs Committee on S. 2881, which would amend the Alaska Omnibus Act, to provide assistance to help the State recover from the effects of the earthquake and subsequent seismic waves. Included in his remarks were proposed amendments. One amendment would reduce the rate of interest on any loans made by the U.S. Government to Alaska to a rate lower than 3½ percent.

On the same date the Senate Committee on Interior and Insular Affairs held and concluded hearings on S. 2881.

The Subcommittee on Territorial and Insular Affairs of the House Committee on Interior and Insular Affairs held hearings June 11, 1964, on H. R. 11438.

**ALASKA TRANSPORTATION RATES:** On June 4, 1964, Senator Gruening spoke from the floor of the Senate concerning the possible reduction of the transportation rates to Alaska. The Senator also referred to the recent filing of a tariff with the Interstate Commerce Commission by the Trans-Continental Freight Bureau which was to become effective June 10. (Congressional Record, pages 12239-12242.)

**ANADROMOUS FISH CONSERVATION:** The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held hearings May 26, 27, and 28, 1964, on H. R. 2392 and H. R. 11160 and similar bills authorizing the Secretary of the Interior to initiate a program for the conservation, development, and enhancement of the Nation's anadromous fish in cooperation with several States. All witnesses appearing before the Subcommittee favored the principles set forth in the bills. The Commissioner of the Fish and Wildlife Service appeared

on behalf of the Interior Department and endorsed H. R. 2392, recommending amendments now incorporated into H. R. 11160. He pointed out that the Service needs additional authority to cooperate with the states in developing plans for the management and manipulation of water and anadromous fish. He indicated such legislation would supplement the Fish and Wildlife Coordination Act. He then recommended a cooperative program with the states, one to enhance the fisheries values as well as mitigate losses. Testimony was received from the Commissioner of the Maine Department of Inland Fisheries and Game, the Chief of the Marine Resources Branch of the California Department of Fish and Game, and from representatives of several private conservation organizations.

H. R. 11398 (Lipscomb) introduced in the House May 26, 1964, a bill similar to H. R. 2392; referred to the Committee on Merchant Marine and Fisheries.

On June 1, 1964, the Speaker of the House presented a memorial of the Legislature of the State of California memorializing the President and the Congress of the United States relative to anadromous fish; referred to the House Committee on Merchant Marine and Fisheries.

**ANTIDUMPING ACT AMENDMENT:** H. R. 11270 (Ellsworth), H. R. 11284 (Moore), and H. R. 11286 (Nix) introduced in the House May 18, 1964, to amend the Antidumping Act, 1921; also H. R. 11304 (Watson) introduced in the House May 19; H. R. 11347 (Fulton) and H. R. 11359 (McClory) introduced on May 21; and H. R. 11441 (Tollefson) introduced on May 28; all were referred to the Committee on Ways and Means. Similar or identical to bills previously introduced.

**CHEMICAL PESTICIDES COORDINATION:** On June 2, 1964, the Senate Committee on Commerce reported favorably, with amendments, S. 1251 (S. Rept. No. 1053), which amends the act of August 1, 1958, in order to prevent or minimize injury to fish and wildlife by the use of insecticides, herbicides, fungicides, and pesticides. The bill as reported "turns out to be more or less a Committee bill."

S. Rept. No. 1053, Protection of Fish and Wildlife from Pesticides (June 2, 1964, report from the Committee on Commerce, United States Senate, 88th Congress, 2nd Session, to accompany S. 1251), 28 pp., printed. The Committee reported the bill with amendments and recommended passage. Contains purpose of the bill, need for the bill, Committee consideration of the bill, agency comments, changes in existing law, and an appendix of notices.

**COMMERCIAL FISHERIES FUND:** On May 20, 1964, the President signed into law S. 627, an act to promote State commercial fishery research and development projects, and for other purposes--P. L. 88-309. The Act authorizes the Secretary of the Interior to cooperate with the States through their respective State agencies in carrying out projects designed for the research and development of the commercial fisheries resources of the Nation.

**CONSERVATION OF MARINE FISHERIES RESOURCES:** On May 20, 1964, the President signed into law S. 1988, an act to prohibit fishing in the territorial waters of the United States and in certain other areas by vessels other than vessels of the United States and by persons other than United States nationals or in-

habitants--P.L. 88-308. In signing the bill the President issued the following statement: "This law fills a long-standing need for legislation to prevent foreign fishing vessels, which in recent years have appeared off our coast in increasing numbers, from fishing in our territorial waters. The new law will not establish any new rights to the continental shelf. But it will make possible the enforcement of whatever rights that now exist or may be established. Since the waters over the continental shelf are high seas, efforts will be made to work out in advance with foreign countries procedures for enforcement there. In this connection, the United States has assured Japan that in such consultations with Japan full consideration will be given to Japan's long-established king crab fishery."

Senator Bartlett on June 5, 1964, spoke from the floor of the Senate concerning the presence of Soviet fishing fleets off U.S. shores. He also inserted an article, "Big Soviet Fleet Reported Fishing in Waters off Mexico," which was published in the Mexico News of May 29. (Congressional Record, pages 12385-12386.)

**CONSUMER PROTECTION:** On June 3, 1964, Congressman Dingell under extension of remarks inserted in that day's Congressional Record (pages A2977-2978) portions of an address given by the Assistant Attorney General in charge of the Antitrust Division of the Department of Justice, delivered before the Conference on the Government's Role in Consumer Protection at the University of Toledo, on April 24, 1964, regarding the Government's role in consumer protection as viewed from the executive-judicial perspective.

**FEDERAL PESTICIDES CONTROL ACT OF 1964:** On May 26, 1964, the House Committee on Agriculture held a hearing on operation of pesticide laws and regulations. Testimony was heard from representatives of three Government agencies.

**FOOD MARKETING NATIONAL COMMISSION: Study of Food Marketing (Hearings before the Committee on Commerce, United States Senate, 88th Congress, 2nd Session), Part I, 126 pp., and Part II, 196 pp., printed. Contains hearings held March 23, 24, 25, and April 8, 13, 16, 22, 23, 29, and 30, 1964, on S.J. Res. 71, and S.J. Res. 71, as amended. Included are statements of various Federal and state officials.**

**S. Rept. No. 1022, Establishing a National Commission on Food Marketing (May 12, 1964, report from the Committee on Commerce, United States Senate, 88th Congress, 2nd Session, to accompany S.J. Res. 71, as amended), 18 pp., printed.** The Committee reported the resolution with amendments and recommended passage. Contains purpose, background, and need for the resolution, committee amendments, cost, section-by-section analysis, agency reports, memorandum, and changes in existing law.

**H. Rept. 1401, National Commission on Food Marketing (May 13, 1964, report from the Committee on Agriculture, House of Representatives, 88th Congress, 2nd Session), 7 pp., printed.** The Committee recommended passage (with amendments) of H.J. Res. 977, to establish a National Commission on Food Marketing to study the food industry from the farm to the consumer. Contains the purpose of the bill, general statement, hearings, committee amendments, and executive communications.

On May 18, 1964, the Senate (after adopting committee amendments en bloc and 2 floor amendments) passed

**S. J. Res. 71**, to establish a National Commission on Food Marketing to study the food industry from the producer to the consumer. Descriptive remarks concerning the bill are found in that day's Congressional Record (pages 10822-10828).

On May 21, 1964, the House Committee on Rules deferred action on H.J. Res. 977, a resolution similar to S. J. Res. 71.

On May 26, 1964, the House Committee on Rules granted an open rule on H.J. Res. 977.

On June 4, 1964, the House passed H.J. Res. 977. This passage was subsequently vacated and S.J. Res. 71, a similar resolution, was passed in lieu after being amended to contain the House-passed language. The House insisted on its amendment; requested a conference with the Senate; and appointed conferees. House adopted amendments relating to approval of employees of the Commission by the Commissioner in lieu of the Chairman; also to broaden proposed study to include effectiveness of dissemination of market news; and the effect of imported foods on U.S. producers, processors, and consumers. Rejected an amendment to reduce authorization of Commission to \$500,000 instead of \$1,500,000. H. Res. 737, the rule under which the legislation was considered, had been adopted earlier by a voice vote.

Committees of both houses have approved joint resolutions to establish a National Commission on Food Marketing. Amendments by the House Committee included a reduction in the authorization for funds from \$2.5 million to \$1.5 million and also provided that the Commission's report is to be completed by July 1, 1965, instead of July 1, 1966, and that it will state only conclusions and findings without making legislative recommendations. House amendments also provided that at least three members of the Commission would be required to conduct hearings, and that the powers of the Commission could be exercised only on majority vote. Amendments by the Senate Committee were minor, including one to bring products such as seafood within the scope of the Commission's investigations. The Senate measure, however, would authorize a two-year study without the fund cut authorized by the House Committee. Both measures (H.J. Res. 977 and S.J. Res. 71) provide for a Commission of 15 members. In the proposed legislation, the duties of the Commission are described as follows: "The Commission shall study and appraise the marketing structure of the food industry including the following: (1) the actual changes in the various segments of the food industry; (2) the changes likely to materialize if present trends continue; (3) the kind of food industry that would assure efficiency of production, assembly, processing and distribution, provide appropriate services to consumers, and yet maintain acceptable competitive alternatives of procurement and sale in all segments of the industry from producer to consumer; (4) the changes in statutes or public policy, the organization of farming and food assembly, processing, and distribution, and interrelationships between segments of the food industry which would be appropriate to achieve a desired distribution of power as well as desired levels of efficiency; and (5) the effectiveness of the services and regulatory activities of the Federal Government in terms of present and probable developments in the industry."

On June 5, 1964, the Senate disagreed to House amendment to S.J. Res. 71. The Senate then agreed to hold conference requested by House, and appointed conferees.

**GREAT LAKES FISHERIES:** On May 19, 1964, Congressman Cederberg and Congressman Chamberlain, under extension of remarks, inserted in that day's Congressional Record (pages A2600 and A2641) a resolution adopted by the Legislature of the State of Michigan urging Congress to speed the proposed financial assistance to the Great Lakes fishing industry and further urging that an inspection system with respect to fresh-water fish imported from Canada be instituted.

**INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES:** On June 1, 1964, the Senate Committee on Foreign Relations submitted to the Senate a favorable report on Executive B, Protocol to the International Convention for the Northwest Atlantic Fisheries (signed at Washington, February 8, 1949), which protocol relates to harp and hood seals and was signed July 15, 1963 (Ex. Rept. No. 8). Ratification of the Protocol by the Senate would indicate the approval of the United States in bringing those species within the responsibility of the Northwest Atlantic Fisheries Commission. (The principal commercial fishery for harp and hood seals is conducted on the ice of the Gulf of St. Lawrence and east of Newfoundland in early spring. Four parties to the Convention presently engage in the fishery: Canada, Denmark, Norway, and the Soviet Union.)

**INTERNATIONAL FOOD STANDARDS:** On June 2, 1964, Senator Anderson inserted in that day's Congressional Record (pages A2924-2926) an address by the Chairman of the U. S. Food and Agriculture Organization Interagency Subcommittee on Codex Alimentarius to the Institute of Food Technologists (24th annual meeting) May 25, Washington, D. C., on "A New Vital Influence in International Food Standards." The Senator in introducing the insertion of the address said: "... the United States, in cooperation with the Food and Agriculture Organization and the World Health Organization, is participating very actively in creating a system of international food standards. New food technology, development of trade areas through the world, and improved transportation have accelerated the need for such a body of food standards..."

**MEDICAL CARE FOR VESSEL OWNERS:** On June 4, 1964, the House Committee on Interstate and Foreign Commerce met in executive session and ordered reported favorably to the House H. R. 3873. (H. Rept. No. 1467) to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service. It appears that the Committee reported this House bill in lieu of the Senate-passed S. 978. The House bill is similar but not identical with the Senate bill. Under the terms of H. R. 3873 the medical service privileges would be extended to "Persons who own vessels registered, enrolled, or licensed under the maritime laws of the United States, who are engaged in commercial fishing operations, and who accompany such vessels, on such fishing operations, and a substantial part of whose services in connection with such fishing operations are comparable to services performed by seamen employed on such vessel or on vessels engaged in similar operations."

H. Rept. No. 1467, Medical Care for Fishing Boat Owners (June 9, 1964, Report from the Committee on Interstate and Foreign Commerce, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 3873), 14 pp., printed. The Committee reported

the bill without amendments and recommended passage. Contains purpose, provisions, and cost of the bill; agency reports; and changes in existing law.

**NATIONAL OCEANOGRAPHY AGENCY:** On May 19, 1964, Congressman Wilson under extension of remarks inserted in the Congressional Record (page A2607) an article from Undersea Technology entitled "Centralizing Oceanography."

**NORTH PACIFIC FISHERIES RESOURCES:** On June 2, 1964, Congressman Pelly inserted in that day's Congressional Record (page A2931) extension of remarks concerning a resolution adopted May 20, 1964, by the Ballard Exchange Club of Seattle, Wash., on protection of North Pacific fisheries. The Congressman remarked that this resolution indicates public concern over the adverse impact the Japanese and Soviet fishing fleets are having on North Pacific fisheries resources.

**OCEANOGRAPHIC LEGAL PROBLEMS:** H. R. 11419 (Lennon) introduced in the House on May 27, 1964, a bill authorizing the appropriation of \$50,000 for a study of the legal problems of management, use, and control of the natural resources of the oceans and ocean beds; referred to the Committee on Merchant Marine and Fisheries.

**RESEARCH PROGRAMS:** On May 19 and 20, 1964, the Subcommittee on Science, Research, and Development of the House Committee on Science and Astronautics held hearings on geographical distribution and indirect costs of Federal research and development. Testimony was given by public witnesses.

**STATE DEPARTMENT APPROPRIATIONS FY 1965:** On May 25, 1964, the Subcommittee of the Senate Committee on Appropriations continued hearings on H. R. 11134, making appropriations for the Departments of State, Justice, and Commerce, the Judiciary, and related agencies for the fiscal year ending June 30, 1965. Testimony was given by several Federal officials. Included are funds for the International Fisheries Commission.

**SUPPLEMENTAL APPROPRIATIONS FY 1964:** On May 8, 1964, the Committee on Appropriations reported (H. Rept. 1386) to the House H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, and for other purposes. The bill passed the House on May 11. The Senate received the House-passed bill on May 12. Bill reported (S. Rept. 1030) in Senate May 27 by the Committee on Appropriations. On May 28 after adopting Committee amendments en bloc and a technical amendment by Senator Pastore, the Senate, by unanimous consent, passed H. R. 11201, making deficiency appropriations for fiscal year 1964. As passed by the Senate, the bill would provide the sum of \$46,570,000 for items relating to Alaskan earthquake damage, which sum includes \$650,000 for repair and rehabilitation of Bureau of Commercial Fisheries facilities and equipment replacement; \$17,000,000 for extension of transitional grants to Alaska to assist the State in recovering from the earthquake effects; and \$150,000 for the necessary expenses of the Federal Reconstruction and Development Planning Commission for Alaska. The Senate insisted on its amendments, asked for conference with the House, and appointed conferees.

On June 2, 1964, the House disagreed to Senate amendments to H. R. 11201, and agreed to the conference

requested by the Senate. House also appointed conferees and scheduled a meeting for June 3.

On June 3, 1964, the House and Senate conferees in executive session agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 11201 (H. Rept. 1457). As approved by the conferees, the bill would provide a total of \$1,336,687,143. The Senate version of the bill provided a total of \$1,349,637,143, and the House-passed figure was \$1,264,913,689.

On June 4, 1964, the House adopted the conference report on H. R. 11201, and sent the legislation to the Senate. The Senate adopted conference report on H. R. 11201 on the same day, concurring in certain House amendments to Senate amendments. This cleared the legislation for the President's signature. As approved by both Houses, the bill still provides \$650,000 for the Bureau of Commercial Fisheries for construction relating to the Alaskan earthquake disaster.

Deficiency Appropriations for 1964 (Hearings before the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session), 266 pp., printed. Contains hearings held on H. R. 11201, making deficiency appropriations for the fiscal year ending June 30, 1964, and for other purposes.

H. Rept. No. 1386, Deficiency Appropriation Bill, 1964 (May 8, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 11201), 28 pp., printed. The Committee submitted the report in explanation of the deficiency appropriations in H. R. 11201. Contains scope and summary of the bill. Included is a table summarizing the budget estimates and amounts recommended in the bill.

S. Rept. No. 1030, Deficiency Appropriation Bill, 1964 (May 27, 1964, report from the Committee on Approp-

priations, United States Senate, 88th Congress, 2nd Session, to accompany H. R. 11201), 35 pp., printed. The Committee reported the bill with various amendments. Contains additional appropriations for various Government agencies.

H. Rept. No. 1457, Deficiency Appropriation Bill, 1964 (June 3, 1964, report from the Committee of Conference, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 11201), 5 pp., printed. The Committee agreed to recommend various agreements to the House and Senate.

On June 9, 1964, the President signed into law H. R. 11201 making deficiency appropriations for fiscal year 1964.

TRADE NEGOTIATIONS: On June 3, 1964, Senator Javits spoke from the floor of the Senate (Congressional Record, pages 12197-12200) and on June 14, Congressman Curtis made a statement under an extension of remarks (Congressional Record, pages A3263-3265) concerning the forthcoming trade negotiations in Geneva under the General Agreement on Tariffs and Trade. Senator Javits and Congressman Curtis both inserted in the Congressional Record, a newspaper article titled "Free Trade Hurdles--Multitude of Non-tariff Obstacles to Imports Troubles GATT Talks--France Rejects Unsanitary U. S. Pork; Europe Fumes at Buy American Policies--Undercutting Geneva Gains?"

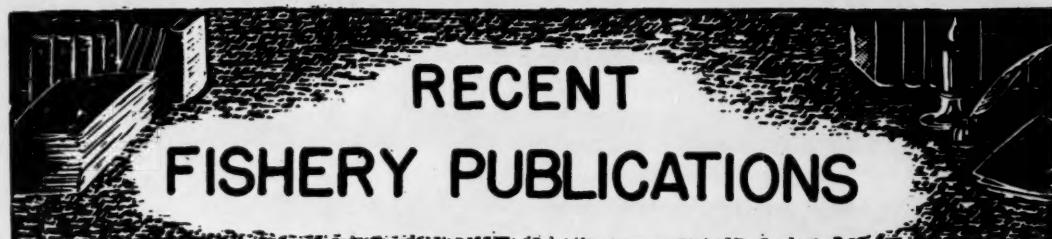
UNITED STATES FISHING INDUSTRY: On May 21, 1964, Senator Kennedy spoke from the floor of the Senate and inserted in the Congressional Record (pages 11168-11170) excerpts from a speech ("A New Thrust for American Fisheries") given by Under Secretary of the Interior James K. Carr at the National Fisheries Institute Convention held in Seattle April 24-28, 1964.



#### UNDERWATER INTERCOM PERMITS SKIN DIVERS TO TALK

In the short history of skin diving as a popular sport, one of the major bottlenecks has been underwater communication which traditionally has been carried out with sign language of the most difficult type. Now they have developed an effective intercom system that works underwater called "Watercom." The new system consists of a special face mask, a throat mike, and a 5-pound cylindrical transmitter strapped to the diver's air tank. Spoken words are picked up by the throat mike, carried to the transmitter on the air tank, amplified, and broadcast into the water so any diver within 100 yards can hear the speaker without any special receiving equipment to bother with.

--By John L. Russell, Jr.  
The Aquarium, May 1964.



## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U.S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.  
MNL - REPRINTS OF REPORTS ON FOREIGN FISHERIES.  
SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.  
SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

- | Number   | Title   |
|----------|---|
| CFS-3291 | Middle Atlantic Fisheries, 1962, Annual Summary (Revised), 6 pp.  |
| CFS-3417 | Fish Sticks and Fish Portions, 1963 Annual Summary, 3 pp.   |
| CFS-3442 | Gulf Coast Shrimp Data, September 1963, 22 pp.  |
| CFS-3459 | Gulf Coast Shrimp Data, October 1963, 23 pp.  |
| CFS-3460 | Massachusetts Landings, July 1963, 9 pp.  |
| CFS-3462 | Georgia Landings, February 1964, 3 pp.  |
| CFS-3463 | North Carolina Landings, February 1964, 4 pp.   |
| CFS-3465 | Massachusetts Landings, August 1963, 9 pp.  |
| CFS-3466 | South Carolina Landings, February 1964, 3 pp.   |
| CFS-3467 | Oregon Landings, 1963 Annual Summary, 2 pp.   |
| CFS-3469 | California Landings, January 1964, 4 pp.  |
| CFS-3470 | Frozen Fish Report, March 1964 (Preliminary), 2 pp.   |
| CFS-3471 | United States Fisheries, 1962 Annual Summary, 16 pp.  |
| CFS-3472 | Massachusetts Landings, September 1963, 9 pp.   |
| CFS-3473 | Gulf Coast Shrimp Data, November 1963, 22 pp.   |
| CFS-3474 | Maine Landings, 1963 Annual Summary (by months), 7 pp.  |
| CFS-3479 | Shrimp Landings, November 1963, 8 pp.   |
| CFS-3482 | Maine Landings, January 1964, 4 pp.   |
| CFS-3485 | Massachusetts Landings, October 1963, 9 pp.   |
| CFS-3486 | Massachusetts Landings, November 1963, 9 pp.  |
| CFS-3488 | Maryland Landings, February 1964, 3 pp.   |
| CFS-3497 | Maine Landings, February 1964, 4 pp.  |
| CFS-3501 | Breaded Shrimp, January-March 1964, 2 pp.   |
| CFS-3500 | Fisheries of the United States, 1963 (A Preliminary Review), 79 pp., illus., April 1964. Contains detailed information on the United States catch of fish and shellfish, production of manufactured fishery products, and foreign trade in fishery commodities. Data contained in the report reveal |

that the catch in 1963 amounted to 4,750 million pounds valued at \$378 million ex-vessel. Of the catch, 2,490 million pounds were used for human food while the remainder was used for the manufacture of industrial products and for bait and animal food. In 1963, for the first time, over half of the U.S. supply of fishery products available was imported--6,500 million pounds, representing 58 percent of the total. A new high was reached in shrimp supplies with 318 million pounds available, in contrast to only 272 million pounds in 1962. The menhaden catch of 1,800 million pounds accounted for 37 percent of the total U.S. catch of all species. Shrimp was the most valuable item (\$70 million) taken, with Pacific salmon running second. The new long-line fishery, principally for Atlantic swordfish, took 2.7 million pounds in comparison to 1.7 million pounds in 1962. During 1963, a considerable migration of the Gulf and South Atlantic shrimp fleet to central and South American countries occurred.

Sep. No. 704 - Shrimp Explorations off Vancouver Island (British Columbia), October-November 1962.

SSR-Fish, No. 469 - Success of Pink Salmon Spawning Relative to Size of Spawning Bed Materials, by William J. McNeil and W. H. Ahnell, 20 pp., illus., January 1964.

SSR-Fish, No. 470 - The Segregation of Red Salmon in the Escapements to the Kvichak River System, Alaska, by Howard Donald Smith, 25 pp., illus., January 1964.

SSR-Fish, No. 472 - Use of Plant Extracts in Serological Studies of Fish, by Fred M. Utter, George J. Ridgway, and Harold O. Hodgins, 22 pp., illus., February 1964.

Drip Formation in Fish. I--A Review of Factors Affecting Drip, by David T. Miyachi, 8 pp. (Reprinted from *Fishery Industrial Research*, vol. 2, no. 2, December 1963, pp. 13-20.)

Inventory of Oceanographic Data for the Western North Atlantic Ocean and the Gulf of Mexico (oceanographic station data, bathythermograph observations, and sea-surface temperature observations), Circular 176, 41 pp., illus., December 1963. A compilation of charts.

THE FOLLOWING REPRINTS FROM *FISHERY BULLETIN*, VOL. 63, NO. 1, 1963, ARE AVAILABLE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240.

Abundance, Age, and Fecundity of Shad, York River,  
Va., 1953-59, by Paul R. Nichols and William H.  
Massmann, pp. 179-187. illus., printed.

Age, Growth, and Maturity of Round Whitefish of the Apostle Islands and Isle Royale Regions, Lake Superior, by Merrill M. Bailey, pp. 63-75, illus., printed.

Age and Growth of the Whitefish in Lake Superior, by  
William R. Dryer, pp. 77-95, Illus., printed.

Cod Groups in the New England Area, by John P. Wise,  
pp. 189-203, Illus., printed.

Comparison of Growth of Four Strains of Oysters  
Raised in Taylors Pond, Chatham, Mass., by William  
N. Shaw and James A. McCann, pp. II-17, illus.,  
printed.

Development of a Mathematical Relationship between Electric-Field Parameters and the Electrical Characteristics of Fish, by Gerald E. Monan and Derek E. Engstrom, pp. 123-136, illus., printed.

Distinguishing Tuna Species by Immunochemical Methods, by George J. Ridgway, pp. 205-211, illus., printed.

Early Larval Stages of the Sea, XIPHOPENEUS KROYERI (Heller), by William C. Renfro and Harry L. Cook, pp. 165-177, illus., printed.

Effect of Fishway Slope on Performance and Biochemistry of Salmonids, by Gerald B. Collins and others, pp. 221-253, illus., printed.

Further Studies on Fishway Slope and Its Effect on Rate of Passage of Salmonids, by Joseph R. Cauley and Clark S. Thompson, pp. 45-62, illus., printed.

Herring Tagging Experiments in Southeastern Alaska  
by Bernard Einar Skud, pp. 19-32, illus., printed.

Identification of New England Yellowtail Flounder Groups, by Fred E. Lux, pp. 1-10, illus., printed.

Influence of Water Velocity upon Orientation and Performance of Adult Migrating Salmonids, by Charles R. Weaver, pp. 97-121, illus., printed.

Some Aspects of the Oceanography of Little Port Walter Estuary, Baranof Island, Alaska, by Charles F. Powers, pp. 143-164, illus., printed.

Theory on Development of Mounds Near Red Bluff, Calif., by Harold A. Gangmark and F. Bruce Sanford, pp. 213-220, illus., printed.

Use of Plant Hemagglutinins in Serological Studies of Clupeoid Fishes, by Carl Sindermann, pp. 137-141, illus., printed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE FISHERY MARKET NEWS SERVICE, U. S. BUREAU OF COMMERCIAL FISHERIES, WYATT BLDG., SUITE 611, 777 14TH ST. NW., WASHINGTON, D. C. 20005.

Number Title  
MNL - 7 - Mexican Fisheries, 1961-63, and First  
Quarter 1964, 6 pp.  
MNL - 23 - Fisheries of Chile, Part II and Part III -  
Central and South Chile, 1960-1962, 18 pp.

MNL-14 - United Kingdom's Fishing Industry, 1959-  
1963. 40 pp.

MNL-32 - Venezuelan Commercial Catch, Foreign Trade, and Major Developments for 1961-1962, 17 pp.

MNL-89 - Peru: Fish Meal and Oil Report, 1963, 8 pp.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES BIOLOGICAL LABORATORY, BOX 3830, HONOLULU, HAWAII 96812.

On the hydrographic condition accelerating the skip-jack's northward movement across the Kuroshio Front, by Hideo Kawai and Minoru Sasaki, 22 pp., illus., processed, June 1963, limited distribution. (Translated from the Japanese, Bulletin of Tohoku Regional Fisheries Research Laboratory, no. 20, March 1962, pp. 1-27.)

Methods of identification for the young stages of tunas and spearfishes. II., by Shoji Ueyanagi and Hisaya Watanabe, 20 pp., illus., processed, April 1964, limited distribution. (Translated from the Japanese, Materials for the Tuna Fisheries Research Council, Nankai Regional Fisheries Research Laboratory, February 1964.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fisheries, 1963, by V. J. Samson, 47 pp., illus., April 1964. (Market News Service, U.S. Fish and Wildlife Service, Rm. 205, Post Office Bldg., San Pedro, Calif. 90731.) A review of 1963 trends and conditions in the California fisheries, including a summary of the sardine fishery during the 1963/64 season when landings were the lowest on record. Among the subjects discussed are the tuna industry and cannery receipts; ex-vessel tuna prices; canned tuna pack; and imports of canned and frozen tuna. Also covered are the fishing fleet developments; the anchovy fishery; and fish meal prices and markets. Included in the statistical tables are data on tuna and tunalike fish--cannery receipts, domestic landings, frozen imported tuna, and canned pack, 1961-63; sardine landings, pack, and meal and oil produced, 1962/63 and 1963/64 seasons; and the cannery receipts and pack of mackerel and jack mackerel, 1961-63. Also contains data on cannery receipts of raw materials and production of anchovies, herring, squid, and pet food; landings of fish and shellfish in the Eureka and San Pedro-Monica areas; imports of fishery products into Arizona and California Customs Districts, 1962-63; and whale fishery, 1961-63. An attractive cover showing the fishermen's Fiesta Time at the Port of Los Angeles enhances this year's report.

California Fishery Market News Monthly Summary,  
Part I - Fishery Products Production and Market  
Data, March 1964, 14 pp. (Market News Service,  
U.S. Fish and Wildlife Service, Post Office Bldg.,  
San Pedro, Calif. 90731.) California cannery receipts,  
of tuna and tunalike fish and other species used for  
canning; pack of canned tuna, tunalike fish, mackerel,  
and anchovies; market fish receipts at San Pedro,  
Santa Monica, and Eureka areas; California and Ari-  
zona imports; canned fish and frozen shrimp prices;  
ex-vessel prices for cannery fish; for the month in-  
dicated.

California Fishery Market News Monthly Summary,  
Part II - Fishing Information. April 1964. 9 pp., illus.

(U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated.

Fishery Industrial Research, vol. 2, no. 2, December 1963, 88 pp., illus., processed. (Branch of Reports, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C. 20240.) This is the third issue of a new periodical which is being published irregularly and which presents papers devoted to research on problems of the fishing industry. This issue has: "Economic Factors Related to Lake Trout Quotas on Lake Superior," by Keith D. Brouillard; "Effect of Storage in Refrigerated Sea Water on Amino Acids and Other Components of Whiting (*Merluccius bilinearis*)," by Edward H. Cohen and John A. Peters; "Drip Formation in Fish. I-A Review of Factors Affecting Drip," by David T. Miyachi; "Storage of Fish in Refrigerated Sea Water," by Edward H. Cohen and John A. Peters; "Technological Investigations of Pond-Reared Fish. I-Product Development from Buffalofish," by Leo J. Sullivan and Harry L. Seagran; and "Bibliography of Publications-Division of Industrial Research, by Branch, Year, and Author, 1955-1961 Inclusive," by Virginia Whorley.

Gulf of Mexico Monthly Landings, Production and Shipments of Fishery Products, February and March 1964, 12 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans 12, La. 70130.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; fishery imports at Port Isabel and Brownsville, Texas, from Mexico; Gulf Menhaden Landings and Production of Meal, Solubles, and Oil; and sponge sales; for the months indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shuckedysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, March 1964, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and

Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--March 1964, 19 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; U. S. shrimp supply indicators; for the month indicated.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1964, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

Anglers' Guide to Sharks of the Northeastern United States, Maine to Chesapeake Bay, by John G. Casey, Circular 179, 34 pp., illus., printed, April 1964, 25 cents.

"Comparison of Various Methods of Hemoglobin Determination on Catfish Blood," by Howard N. Larsen, article, The Progressive Fish-Culturist, vol. 26, no. 1, January 1964, pp. 11-15, illus., processed, single copy 25 cents.

"Dry Concentrates as Complete Trout Foods," by Arthur M. Phillips, Jr., Glen L. Hammer, and Earl A. Pyle, article, The Progressive Fish-Culturist, vol. 26, no. 1, January 1964, pp. 21-24, processed, single copy 25 cents.

"An Experimental Sea Lamprey Barrier," by Thomas M. Stauffer, article, The Progressive Fish-Culturist, vol. 26, no. 2, April 1964, pp. 80-83, illus., processed, single copy 25 cents.

"A Modified Scoop Trap for Sampling Downstream-Migrant Salmon in Turbid Glacial Rivers," by William R. Meehan, article, The Progressive Fish-Culturist, vol. 26, no. 1, January 1964, pp. 42-46, illus., processed, single copy 25 cents.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ALGAE:

"Algae, The Pondowners Scummy Scourge," by H. D. Kelly, article, *Alabama Conservation*, vol. XXXIV, no. 1, December 1963-January 1964, pp. 14-16, illus., printed. Alabama Department of Conservation, 64 N. Union St., Montgomery 4, Ala.

### AMINO ACIDS:

"Fish and Fish Products. Part IV--Evaluation of Certain Important Types of Fish for Their Valuable Constituents and Essential Amino Acids," by M. Qudrat-I-Khuda, Kh. M. Quddusur Rahman, and N. A. Khan, article, *Scientific Researches*, vol. 1, no. 1, January 1964, pp. 49-56, illus., printed. East Regional Laboratories of P.C.S.I.R., Mirpur Rd., Dharmundi, Dacca-2, East Pakistan.

### ANCHOVY:

"Experiencias sobre el Empleo de Anchoveta Fresca (*Engraulis ringens*) en la Alimentacion de Cerdos" (Research on the Use of Fresh Anchovy--*Engraulis ringens*--in the Feeding of Hogs), by A. Bacigalupo and others, article, *Anales Científicos*, vol. 1, no. 1, April-May-June 1963, pp. 18-39, illus., printed in Spanish with English summary. Universidad Agraria, Departamento de Publicaciones, Apartado 456, Lima, Peru.

### ANTIBIOTICS:

Problems in the Use of Antibiotic Dips for the Preservation of Fresh Atlantic Groundfish Fillets, by C. H. Castell and Jacqueline Dale, Bulletin No. 138, 70 pp., 1963, printed. Fisheries Research Board of Canada, Ottawa, Canada.

### ANTIOXIDANTS:

"Nutritive Value of Marine Oils. II--Effects of in Vivo Antioxidants in Feeding of Menhaden Oil to Swine," by J. E. Oldfield, R. O. Sinnhuber, and A. A. Rasheed, article, *Journal of the American Oil Chemists' Society*, vol. 40, August 1963, pp. 357-360, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

### ARGENTINA:

"Piscicultura del Pejerrey" (Pond Culture of the Pejerrey), article, *Asuntos Agrarios*, vol. XI, no. 125, January 1964, p. 5, illus., printed in Spanish. Ministerio de Asuntos Agrarios, Departamento de Publicaciones, Avda. 51, no. 774, La Plata, Argentina.

### ARTIFICIAL REEFS:

*Artificial Habitat in the Marine Environment*, by John G. Carlisle, Jr., Charles H. Turner, and Earl E. Ebert, Fish Bulletin 124, 94 pp., illus., printed. Documents Section, Department of Fish and Game, P.O. Box 1612, Sacramento, Calif. 95807. A study of changes, caused by offshore drilling, in the habitat of marine fish dwelling in artificial reefs. Findings showed that those changes were generally beneficial to the fish and plants; and depositing washed drill cuttings on the bottom at those sites was neither deleterious nor beneficial to the marine life in the area.

### BACTERIAL CONTAMINATION:

*Coliform Contamination in Lobster Meat Traced to Cooler Construction*, by John M. Graham, 3 pp., illus., printed. (Reprinted from *Canadian Fisheries Reports*, no. 2, September 1963, pp. 25-27.) Fish Inspection Laboratory, Department of Fisheries of Canada, Sheddac, N.B., Canada.

### BACTERIOLOGY:

"Radiation-Resistant, Pigmented Coccus Isolated from Haddock Tissue," by Norman S. Davis, Gerald J. Silverman, and Edmund B. Masurovsky, article, *Journal of Bacteriology*, vol. 86, August 1963, pp. 294-298, printed. Williams and Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

### BALTIC SEA:

*Changes in Commercial Fish Stocks in Baltic Sea under Influence of Oceanographic Factors USSR*, by T. F. Dement'yeva, OTS 64-21653, 15 pp., illus., printed, February 26, 1964, 50 cents. (Translated from the Russian, *Okeanologiya*, vol. 3, no. 5, 1963.) Office of Technical Services, U.S. Department of Commerce, Washington, D. C. 20235.

### BARRACUDA:

*Systematics and Life History of the Great Barracuda, SPHYRAENA BARRACUDA (Walbaum)*, by Donald P. DeSylva, Studies in Tropical Oceanography No. 1, 186 pp., illus., printed, October 1963, \$2.50. Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami, Fla. 33149. The great barracuda is found in all tropical seas, with the exception of the eastern Pacific Ocean. Poisoning in humans who have eaten fresh barracuda is due to a toxin in the meat and not from bacterial poisoning. In the western Atlantic, poisonings have occurred throughout the year. There seems to be no relation between attainment of maturity or the spawning cycle and the poisonous nature of the flesh. Evidence is presented in this report for a food-chain origin of the toxin, and mechanisms are discussed for the transmission of the toxin from planktonic and benthic algae to barracuda by way of intermediate organisms. A summary of the 29 attacks reputedly made by these fish on humans is presented and analyzed.

### BELGIUM-LUXEMBOURG:

*Foreign Trade Regulations of Belgium-Luxembourg*, by Robert H. Walker, OBR 64-26, 12 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) The Belgium-Luxembourg Economic Union (BLEU) has followed a liberal, outward-looking trade policy, reflecting its heavy dependency on foreign markets and suppliers. Imports have been almost completely liberalized; i.e. admitted without quantitative restrictions, and items still restricted or subject to licensing are for the most part liberally treated. The report discusses trade policy, import tariff system, sales and other internal taxes, documentation, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, BLEU export controls, United States import and export controls, and diplomatic representation between the two countries.

### BIOCHEMISTRY:

"Determination of Ammonia Nitrogen in Salted Sardines," by C. Bibic, article, *Chemical Abstracts*, vol.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

58, April 29, 1963, 9558d, printed. American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

Introduction to the Biochemistry of Foods, by J.B.S. Braverman, 351 pp., printed, 1963, 70s. (about US\$9.80). Elsevier Publishing Company, 52 Vanderbilt Ave., New York, N. Y. 10017.

#### BRAZIL:

Relatório do Projeto de Pesca Exploratória na Costa de Santa Catarina, Janeiro-Fevereiro, 1963 (Report on the Exploratory Fishing Project along the Santa Catarina Coast, January-February 1963), 65 pp., illus., processed, 1964. Setor de Pesquisas, Departamento Estadual de Caca e Pesca, Estado de Santa Catarina, Florianópolis, Santa Catarina, Brazil. This is a report on an exploratory fishing project carried out by the State of Santa Catarina Fish and Game Department, with technical assistance from FAO, along the coast of that State in southern Brazil, between latitudes 26° S. and 29°20' S., during January and February 1963. The vessel used was a small research vessel of 15 meters length. The otter trawl used was 12 meters long (with headline of 24 meters, and footrope of 30 meters), made of cotton, with internal stretched mesh sizes from 10 centimeters in the foreparts to 58 millimeters in the cod end. Species trawled included sea bob, white shrimp (Penaeus schmittii), sharks, and flatfish.

#### CANADA:

The Commercial Fisheries of British Columbia, 100 pp., illus., processed, December 1963. Bureau of Economics and Statistics, Department of Industrial Development, Trade, and Commerce, Victoria, B. C., Canada. Provides a general survey of the fishing industry and relates the industry's markets, production, labor force, capital investment, and other expenditures to the provincial economy. The principal emphasis is on the following aspects of the industry rather than on species of fish, areas of catch, or conservation problems: markets; production; capital investment and other expenditures; the labor force; and other aspects of the industry (including international relations and the role of government in the fisheries). While the most current statistics and information available are presented, the principal years surveyed are 1960 and 1958. The general conclusion is that the industry is an important contributor to the provincial economy in terms of employment, production, and investment.

Fisheries Statistics of British Columbia, 1963 (Preliminary), 14 pp., processed, April 1964. Canadian Department of Fisheries, Pacific Area, Economics Branch, 1155 Robson St., Vancouver 5, B. C., Canada. Discusses the total value of fish and fish products produced in 1963 with an analysis of the decrease in market value from the previous year; marketing by species, and landed and market value, 1950-63; canned pack, and production and utilization of salmon; and landings and value of herring and by-products, halibut, soles, crab and shrimp, and other species. Also covers fishing vessels, gear and equipment, and number of licensed fishermen. Includes statistical tables on landings and values by species and by years; landings and manufactured products; salmon pack, 1963; and other similar data.

Fisheries Statistics of Canada 1961 (Canada Summary), vol. I, part 3A, March 1964, 60 pp., printed in French and English, 75 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada. This report provides a summary of the Canadian fisheries, arranged to show separately the three main fisheries--Atlantic, Pacific, and Inland. Also contains statistical tables on landings, quantity, and value by species and provinces; value of exports and imports of fish and fishery products; employment in the primary industry; Canadian lobster pack; British Columbia salmon pack; and fishing bounties paid to vessels and boats.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 2, March 1964, 214 pp., illus., printed, single copy C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, these articles: "Winter Cod Taggings off Cape Breton and on Offshore Nova Scotia Banks, 1959-62," by W. R. Martin and Yves Jean; "Variability in Paper Electrophoretic Patterns of the Serum of Landlocked Sea Lamprey, Petromyzon marinus Linnaeus," by M. L. H. Thomas and H. R. McCrimmon; "Structural Homogeneity in Unsaturated Fatty Acids of Marine Lipids. A Review," by R. G. Ackman, "Changes in Glycogen and Lactate Levels in Migrating Salmonid Fishes Ascending Experimental 'Endless' Fishways," by Anne R. Connor and others; "Cod Liver Oil: Component Fatty Acids as Determined by Gas-Liquid Chromatography," by R. G. Ackman and R. D. Burgher; and "Observations on the Milky Condition in Some Pacific Coast Fishes," by Max Patashnik and Herman S. Groninger, Jr.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1963, 26 pp., illus., processed, March 31, 1964. Department of Fisheries of Canada, Pacific Area, 1155 Robson St., Vancouver 5, B. C., Canada.

#### CANNING:

"Canning Fresh-Water Fish. Part 3." by A. W. Lantz, article, Progress Reports of the Biological Station and the Technological Unit, No. 2, May 1961, pp. 37-47, printed. Fisheries Research Board of Canada Technological Unit, Ontario, Canada.

#### CHESAPEAKE BAY:

Chesapeake Science, vol. 4, no. 4, December 1963, 62 pp., illus., printed, single copy 75 cents. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Includes, among others, these articles: "Monogenetic Trematodes from Some Chesapeake Bay Fishes, Part I--The Superfamilies Capsaloidea Price, 1936 and Diclidophoroidea Price, 1936," by J. W. McMahon; "Summer Food of Juvenile American Shad in Virginia Waters," by W. H. Massmann; and "Sport Fishing Survey of the Lower Potomac Estuary, 1959-1961," by C. M. Frisbie and D. E. Ritchie, Jr.

#### CHILE:

Foreign Trade Regulations of Chile, by William E. Spruce, OBR 64-23, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) A

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

report offering information to businessmen interested in export-import trade with Chile. Discusses Chile's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Chile's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### CHLORTETRACYCLINE:

"Method for Chlortetracycline Determination in Fish," by G. B. Dubrova and Yu. I. Rubinshtein, Chemical Abstracts, vol. 57, October 29, 1962, 11614e printed. American Chemical Society, 1155 16th St. NW., Washington 6, D.C.

#### CHOLESTEROL:

"A Comparison of the Effects of the Polyunsaturated Fatty Acids of Cuttlefish Liver Oil and Cottonseed Oil on Cholesterol Metabolism," by T. Kaneda and R. B. Alfin-Slater, article, Journal of the American Oil Chemists' Society, vol. 40, August 1963, pp. 336-338, printed. American Oil Chemists' Society, 35 East Wacker Drive, Chicago 1, Ill.

#### COLOMBIA:

"Cinco Especies de Peces se Han Escogido para una Campaña" (Five Species of Fish Have Been Selected for a Campaign), article, El Tiempo (Bogota), May 1, 1964, p. 34, printed in Spanish. El Tiempo, Bogota, Colombia. (A limited number of copies of a translation are available from Social Projects Department, American Institute for Free Labor Development, 1925 K St. NW., Suite 406, Washington, D.C. 20006.) Discusses the proposed fresh-water fish-culture program in Colombia; the five species of both temperate zone and tropical-type fish chosen for culture; and the projected establishment of a Pisciculture Institute at Buga. The purpose of the program is the ultimate establishment of fish ponds throughout Colombia and their production of supplemental protein for the national diet.

#### CUBA:

World Trade with Cuba, 1961-62, OBR 64-41, 4 pp., processed, March 1964, 15 cents. Bureau of International Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) This special report presents statistics on free-world and Sino-Soviet bloc trade with Cuba. The statistical tables show: the value of this trade as reported by Cuba's trading partners, 1961-62; a historical series of data through 1960, based on Cuban statistics; and tabulations made from official foreign trade publications of the free-world countries.

#### ECUADOR:

Foreign Trade Regulations of Ecuador, by Gary D. Adams, OBR 64-28, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Current import policy, although still largely oriented toward revenue collection, is also designed to help stimulate Ecuadorian industry and agriculture, to discourage contraband imports, and to preserve foreign exchange for the importation of items considered essential for national economic well-being. The

report includes information on Ecuador's import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Ecuador's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### EDUCATION:

Bulletin, Institute of Marine Science, University of Miami, 1964-1965, vol. 38, no. 7, February 1964, 30 pp., illus., printed. University of Miami, Coral Gables, Fla. Describes graduate degrees and courses offered in fisheries, marine biology, and oceanography under the Department of Marine Science.

#### ENZYMES:

"Glycolytic Enzymes in the Tissues of a Salmonoid Fish (*Salmo gairdnerii gairdnerii*), by Robert A. MacLeod, R. E. E. Jonas, and E. Roberts, article, Canadian Journal of Biochemistry and Physiology, vol. 41, September 1963, pp. 1971-1981, printed. National Research Council, Ottawa 2, Canada.

"Studies on Proteolytic Enzyme of Liver of King Crab, *Paralithodes camtschatica* (Tilesius). I--Isolation of the Crystalline Enzyme," by Tsuneyuki Saito, and others. Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, October 1962, pp. 1015-1019, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

#### EUROPEAN FREE TRADE ASSOCIATION:

The European Free Trade Association--Today and Tomorrow, 49 pp., illus., printed, January 1964, \$3. McGraw-Hill, Inc., TMIS Annex, 351 W. 41st St., New York, N.Y. In 5 main sections this report examines the development of EFTA; organizational matters; policy; markets and trade patterns in the EFTA area; EFTA and the 1964 Kennedy Round of tariff negotiations; and other matters essential to an understanding of the Association.

#### FARM PONDS:

"Use and Value of Farm Ponds," article, The Tennessee Conservationist, vol. XXX, no. 4, April 1964, pp. 14, 22, illus., printed. The Tennessee Conservationist, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville Tenn. A fishpond can be a delightful part of a farm, according to the author. A good pond makes use of the land; provides water for livestock, fire protection, and recreation; and when properly managed it can be an extra source of income to the owners.

#### FATTY ACIDS:

"Incorporation of Linolenic-1<sub>c</sub>14 Acid into Eicosapentaenoic and Docosahexaenoic Acids in Fish," by Mitsu Kayama, and others, article, Journal of the American Oil Chemists' Society, vol. 40, September 1963, pp. 499-502, printed. American Oil Chemists' Society, 35 East Wacker Dr., Chicago 1, Ill.

"A Study of the Hypocholesterolemic Activity of the Ethel Esters of the Polyunsaturated Fatty Acids of Cod Liver Oil in the Chicken. I--Effect on Total Serum Cholesterol; II--Effect on Serum and Tissue Cholesterol and Aortic and Coronary Atherosclerosis," by Samuel G. Kahn and others, article, Journal of Nutrition, vol. 80, August 1963, pp. 403-413,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

printed. American Institute of Nutrition, 36th St. at Spruce, Philadelphia 4, Pa.

#### FEDERAL REGULATIONS:

Cumulative Pocket Supplement to Code of Federal Regulations, Title 50, Wildlife and Fisheries (as of January 1, 1964), 126 pp., printed, 1964, 50 cents. Federal Register Office, General Services Administration, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

#### FISH BEHAVIOR:

"The Schooling of Fishes," by E. Shaw, article, Scientific American, vol. 206, no. 6, 1962, pp. 128-134, 137-138, printed. Scientific American Inc. 415 Madison Ave., New York 17, N. Y.

#### FISH BLOOD:

"Studies on the Auto-Oxidation Velocity of Fish Myoglobin," by Fumio Matsuura, and others, Bulletin of the Japanese Society of Scientific Fisheries, vol. 28, February 1962, pp. 201-216, printed. Japanese Society of Scientific Fisheries, Shiba-Kaigandori, Minato-Ku, Tokyo, Japan.

#### FISHERY REGULATION:

"Optimization and Suboptimization in Fishery Regulation," by Ralph Turvey, article, The American Economic Review, vol. LIV, no. 2, Part I, March 1964, pp. 64-76, illus., printed, single copy \$2. The American Economic Review, Stanford University, Stanford, Calif. 94305. The purpose of this article is to show that fishery regulation is one of those spheres of economic policy where what is the best thing to do depends on what can be done. This is usually illustrated by the analogy that, if one wants to climb as high as possible but cannot climb all the way up the highest mountain, the best thing to do may be to walk in the opposite direction and climb to the top of a lower one. If the highest mountain is to be climbed, then regulation must extend not only to the scope of the problem but to the mode of operation as well.

#### FISHERY RESEARCH:

Research in Fisheries, 1963, edited by Ted S. Y. Koo, Contribution No. 156, 79 pp., illus., printed, March 1964. Research in Fisheries, University of Washington, Fisheries Center, Seattle, Wash. 98105. Presents papers on Alaska salmon studies, other fish projects, ecology and taxonomy, shellfish, food science, and related subjects.

#### FISH FAT:

"On the Structure of the Depot Fats of Marine Fish and Mammals," by H. Brockerhoff and R. J. Hoyle, article, Archives of Biochemistry and Biophysics, vol. 102, September 1963, pp. 452-455, printed. Academic Press Inc. 111 Fifth Ave., New York 3, N. Y.

#### FISH FOOD:

"Revolution in Fish Diets," by Keen Buss, article, The Aquarium, vol. 33, no. 5, May 1964, pp. 16-17, printed, single copy 40 cents. The Aquarium Publishing Co., Box 832, Norristown, Pa. 19404.

#### FISH MEAL:

Azeotropic Method of Obtaining Fish Meal, USSR, by Yu. S. Davydova, OTS 64-21691, 10 pp., printed, Feb-

ruary 29, 1964, 50 cents. (Translated from the Russian, Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskoj Rybnoj Khozyastva i Okeanografii, vol. 45, 1962.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

#### FISH MUSCLE:

"Studies on Bound Water in Fish Muscle," by Minoru Akiba, article, Memoirs of the Faculty of Fisheries, vol. 9, no. 2, 1951, pp. 85-179, printed. Faculty of Fisheries, Hokkaido University, Kameda-Machi, Hakodate, Japan.

#### FISH OILS:

"The Oxidation of a Highly Unsaturated Herring Oil," by Harald Astrup, article, Chemistry and Industry, January 18, 1964, pp. 107-108, printed. Society of the Chemical Industry, 14 Belgrave Sq., London SW1, England.

#### FREEZING:

"Air Blast Freezing of Kippers," by J. Graham and J. H. Merritt, article, Modern Refrigeration, vol. 66, September 1963, pp. 837-840, 862, printed. Refrigeration Press Ltd. Maclarens House, 131 Great Suffolk Street, London, SE1, England.

#### FUR SEALS:

"The Return of the Antarctic Fur Seal," by Fergus O'Gorman, article, New Scientist, vol. 20, no. 365, November 14, 1963, pp. 374-376, illus., printed, single copy 1s. (about 15 U. S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. The Antarctic fur seal's reappearance on the South Georgia, South Orkney, South Shetland, and South Sandwich Islands provides an example of a population recovery, since the species was almost wiped out by sealers in the last century. Today, there are at least 20,000 individuals on one island and they will doubtless be harvested again--after scientific study.

#### GAR:

"The Longnose Gar," by Norvel Netsch, article, The Tennessee Conservationist, vol. XXX, no. 4, April 1964, pp. 14, 22, illus., printed. The Tennessee Conservationist, 264 Cordell Hull Bldg., 436 Sixth Ave. N., Nashville, Tenn.

#### GEAR:

"Shock Absorber for Driftnet Warp," by V. B. Fershtman, article, Rybnoe Khoziaistvo, vol. 38, no. 2, 1962, pp. 36-42, printed in Russian. V. Krasnosel'skaiia 17, Moscow, U.S.S.R.

#### GERMAN FEDERAL REPUBLIC:

Informationen fur die Fischwirtschaft, vol. 10, no. 6, 1963, 39 pp., illus., processed in German. Bundesforschungsanstalt fur Fischerei, Hamburg-Altona 1, Palmaille 9, Germany. Contains, among others, these articles: "FFS 'Walther Herwig' von Erster Forschungsfahrt Zuruck" (The Walther Herwig Has Just Returned from Her First Research Trip); "Fischerei auf den Bankheringen in der Nordsee 1963" (Fisheries of Bank-Herring in the North Sea in 1963); "Heringsfischerei der USSR in der Nordsee" (Herring Fisheries of the U.S.S.R. in the North Sea); and "Die Thunfischerei in Deutscher Sicht" (German Outlook on Tuna Fishery).

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#### GHANA:

Establishing a Business in Ghana, by Evelyn M. Schwartztrauber, OBR 64-12, 8 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) A report of help to businessmen considering an investment in Ghanaian industry. The Capital Investments Act 1963 aims to encourage foreign private investment by providing incentives, such as tax exemptions, and by guaranteeing the repatriation of profits and capital. The report discusses government policy on private foreign investment; entry, remittance, and repatriation of capital; and trade factors--tariff and trade concessions, and advantage of location in Ghana. Also covers business organization, laws and regulations affecting employment, and cost factors.

#### GULF AND CARIBBEAN:

Bulletin of Marine Science of the Gulf and Caribbean, vol. 14, no. 1, March 1964, 187 pp., illus., printed, single copy \$2. University of Miami Press, Coral Gables, Fla. Includes, among others, article on: "Observations on Burrowing Behavior of the Pink Shrimp, Penaeus duorarum, Burkenroad," by Charles M. Fuss; "Single File Migration of the Spiny Lobster, Panulirus argus (Latrelle)," by William F. Herrnkind and William C. Cummings; and "Enoploteuthis anapsis, a New Species of Enoploteuthid Squid (Cephalopoda: Oegopsida) from the Atlantic Ocean," by Clyde F. E. Roper.

#### HONDURAS:

Foreign Trade Regulations of Honduras, OBR 64-21, 8 pp., printed, February 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.) Present Honduran trade policy is intended to implement the Central American Common Market agreements. Although these agreements tend to be restrictive compared to past Honduran trade policy, simplified procedures and an expanding Central American market may make the overall trade picture favorable for U.S. exports. The report includes information on the Honduran system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Honduras' export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### INDIA:

The Wealth of India, Raw Materials 4, Supplement: Fish and Fisheries, 132 pp., printed, 1962. Council of Scientific and Industrial Research, New Delhi, India.

#### INTERNATIONAL FISHERIES CONVENTION:

International Fisheries Convention of 1946, The Permanent Commission, Report by the President on the Eleventh Meeting, 29 pp., processed in French and English, 1964. Office of the Permanent Commission, Rm. 620, East Block, Whitehall Pl., London SW1, England. Includes a report by the President on the Eleventh Meeting of the Permanent Commission, held in London, May 1963; a list of names of dele-

gates, advisors, and observers attending the meeting; and the agenda. Also presents a report by the Finance Committee; and a press notice issued after the Eleventh Meeting.

#### ISRAEL:

Foreign Trade Regulations of Israel, OBR 64-30, 8 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.) Israel uses its trade policy to further its developing economy by assigning the highest priority to imports of foods, industrial raw materials, machinery, and such other products as are considered economic necessities. The report discusses Israel's import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Israel's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

#### ITALY:

Bollettino di Pesca, Piscicoltura e Idrobiologia, vol. XVII, no. 2, July-December 1962, 133 pp., illus., printed in Italian with French and English summaries, single copy L. 600 (about 95 U.S. cents). Laboratorio Centrale di Idrobiologia, Piazza Borgesche, 91, Rome, Italy. Contains, among others, article on: "Studi sulla Biologia e Pesca di Xiphias gladius L." (Study on Biology and Fishery of Swordfish, Xiphias gladius L.), by Antonino Gavaliere; "Osservazioni sul Ritmo di Accrescimento e sullo Sviluppo di Popolazioni di Trota (Salmo trutta fario L.)" (Observation on the Rate of Increase and Its Influence on the Population of Trout--Salmo trutta fario L.) and "Esperimenti di Allevamento di Trota Marmorata (Salmo marmoratus Cuv.)" (Experiment in Rearing Marmorata Trout--Salmo marmoratus Cuv.).

#### JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 2, August 1963, 86 pp., illus., printed in Japanese with English abstracts and tables. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Includes, among others, articles on: "Larvae and Young of the Whiting, Theragra chalcogramma (Pallas) from the North Pacific," by K. Kobayashi; "Freeze Vacuum Drying of Marine Products. I," by K. Kobayashi and S. Igarashi; "Studies on Air Screen in Water. II-(1)," by S. Igarashi; "Lipids of Flounder. III; IV," by H. Igarashi and others; "Studies on Spoilage of Fish Sausage. I; II," by E. Tanikawa, T. Motohiro, and M. Akiba.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 14, no. 3, November 1963, 76 pp., illus., printed in English except as noted. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Presents, among others, article on: "The Normal Developmental Stages of the Pond Smelt, Hypomesus oculatus (Pallas)," by Juro Yamada; "Photosynthesis of a Natural Phytoplankton Population Mainly Composed of a Cold Diatom, Thalassiosira hyalina, in Hakodate Harbor, March 1962," by Shigeru Motoda and others; "On the Effects of Environmental Factors upon the Reproduction of Fishes," by Hiroshi Yoshioka; "Devices of Simple Plankton Apparatus. II."

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by Sigeru Motoda; "Freeze Vacuum Drying of Marine Products. II," by Kiichiro Kobayashi and Shuzo Igarashi (in Japanese with English abstract); "Studies on Complete Utilization of Squid (*Ommastrephes sloani pacificus*). XIX," by Eiichi Tanikawa, Akiba Minoru, and Terushige Motohiro (Japanese with English abstract); "Likes and Dislikes of Fish Meat. Part I-By Some Americans," by Keiichi Oishi and Ayako Okumura (Japanese with English abstract).

**Kaigai Gyogyo (Overseas Fisheries)**, no. 16, 1964, 51 pp., illus., printed in Japanese. International Fisheries Co-Operative Organization, 3 Banchi, 2 Chome, Sawai-cho, Chiyoda-ku, Tokyo, Japan. Includes the following articles: "Establishment of an Overseas Fisheries Policy," by K. Nakatani; "International Problems Facing the Tuna Industry," by A. Takashiba; "A Visit to the Cook Islands," by N. Sumida; "Present Condition of Overseas Fisheries;" "Overseas Advancement of the Japanese Coastal and Offshore Fisheries," by Y. Ikeda; "Foreign Private Capital Investment Structure of Developing Nations;" and "Tanganyika Fisheries Survey Report."

**Yearbook of Fisheries--1963**, No. 10, 910 pp., illus., printed in Japanese, May 15, 1963, 1,700 yen (about US\$2.) Suisan Sha, 8, San'ei-cho, Shinjuku-ku, Tokyo, Japan. This report covers the period July 1961 through December 1962. Includes sections on fishery legislation and administration; fishery products production--whaling, salmon and trout industries, mothership crab operations, bonito and tuna fishing, the saury fishery, and other important fisheries; and economics of the fishery industries--prices, transportation, consumption, foreign trade, labor, and patents issued. Also covers management--capitalization, cooperatives, unions, and trade associations; and international relations--commissions and conventions, Japan's overseas fisheries, and world fishing industries. Presents many statistical tables showing data on landings of whales, marine and fresh-water fish, and processed products; number of fishermen; quantity of fishery products purchased per family in rural and in urban areas; quantity of exports of fresh and frozen, dried and smoked, and canned fish; amount of capital invested in the fishing industries; and other related information.

#### KOREA:

**Bulletin of Fisheries College, Pusan National University**, vol. V, no. 1, September 1963, 76 pp., illus., printed in Korean with English abstracts. Fisheries College, Pusan National University, Pusan, Korea. Contains, among others, these articles: "On Some Trematodes Whose Intermediate Hosts are Brackish Water Fishes. II--The Life History of *Pygidiopsis summus*, the Intermediate Host of Which is *Mugil cephalus*," by Seh Kyu Chun; "On the Development of a Freshwater Snail, *Parafossarulus manchouricus Bourguignat*;" "Food Preservation by Ionizing Radiations. I--The Combined Effects of Ionizing Radiation and Smoking on Fish Meat Preservation, and III--Preservation of the Dried Laver," by Byung Sun Chung; "On the Preservation of Korean Fish-Cake Products. I--On the Preservative Effects by Food Preservatives," by Wi Kyung Choi; and "An Example of Raising Korean Catfish *Parasilurus asotus* (Linne) in a Small Pond," by In Bae Kim.

#### LOUISIANA:

**Louisiana Fishery: The Coastal Marshes**, by Larry H. Ogren, Wildlife Education Bulletin No. 35, 7 pp., illus., printed. (Reprinted from Louisiana Conservationist, April 1962.) Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans 16, La. Discusses estuarine biology and the fishery for brackish-water fish in Louisiana.

#### MARINE ALGAE:

**Evaluation of Certain Marine Algal Flagellates for Mass Culture**, by Richard W. Eppley, OTS 63-10364, 15 pp., processed, November 1963, \$1.60. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

**Research on the Chemical Composition and Digestibility of Algal Cell Walls**, by Milton J. Becker and Alan M. Shefner, OTS 63-10066, 28 pp., processed, November 1963, \$1. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### MECHANICAL DRYING:

"**Drying Fish Quickly Without Cooking It**," article, New Scientist, vol. 19, September 5, 1963, p. 490, printed. Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

#### MISCELLANEOUS:

**Fisheries as a Profession**, 5 pp., processed, September 1, 1963. Division of Salt Water Fisheries, Florida Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla. Discusses briefly the importance of the fishery resource, educational requirements for work in fisheries biology and related fields, and types of work in those fields. Also covers personal requirements, salaries, benefits, and opportunities for employment.

#### NERVOUS SYSTEM:

The following processed reports are for sale by the Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230, at 50 cents a copy.

**Chemoreception in Crustaceans. Report No. 1: Variability in the Chemoreception of Amphipods (*GAMMARUS LOCUSTA* and *G. LACUSTRIS*)**, by A. N. Zubov, OTS 63-11164, 8 pp., illus., 1963. (Translated from the Russian, Akademiya Nauk SSSR, Trudy Murmanskogo Morskogo Biologicheskogo Instituta, vol. 6, no. 2, 1960, pp. 245-252.)

**Role of the Receptors of the Body Surface in the Mechanism of the Reaction of Fish to Electric Currents**, by N. V. Bodrova and B. V. Krayukhin, OTS 63-11111, 8 pp., 1963. (Translated from the Russian, Trudy Instituta Biologii Vodokhranilishch, vol. 6, no. 3, 1960, pp. 266-272.)

#### NETHERLANDS:

**Foreign Trade Regulations of the Netherlands**, by Ann P. Brosnan, OBR 64-31, 6 pp., printed, March 1964, 15 cents. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Because of the importance of foreign trade to the country's economy, the Netherlands has been traditionally in favor of the greatest possible elimination of trade barriers. This report discusses the import tariff system, sales and other internal tax, documentation and fees, and special customs provisions. Also covers nontariff import trade controls, Netherlands' export controls, United States foreign trade controls, and government representation between the two countries.

#### NEVADA:

Fishes and Fisheries of Nevada, by Ira La Rivers, 782 pp., illus., printed, 1962, distribution limited. Nevada Fish and Game Commission, Box 678, Reno, Nev.

#### NORWAY:

Fiskerne i Norge; Okonomi og Politikk (The Fisheries in Norway; Economics and Politics), by Gerhard Meidell Gerhardsen, 192 pp., illus., printed, 1964, Kr. 38.50 (about US\$5.40). Oslo University Press, Universitetsforlaget, Oslo, Norway. The early chapters of this book cover the background and problems of the Norwegian fisheries; natural resources; fishermen and their equipment; and profitability and regulation of the industry. Later chapters discuss landings and ex-vessel prices; processing and exporting of fish; government fishery institutions and administration; and related information.

#### NUTRITION:

Let the Sea Nourish Your Health, by Earl Ubell, 4 pp., illus., printed. (Reprinted from House Beautiful, June 1963.) Hearts Corp., 572 Madison Ave., New York, N. Y. 10022.

#### OCEANOGRAPHY:

Explorers of the Sea. Famous Oceanographic Expeditions, by Muriel L. Guberlet, 234 pp., illus., printed, 1964, \$4.50. Ronald Press, 15 E. 26th St., New York 10, N. Y.

International Indian Ocean Expedition Newsletter, India, no. 3, December 1963, 12 pp., printed. The Indian National Committee on Oceanic Research, Council of Scientific and Industrial Research, B-7, Hauz Khas Enclave, New Delhi-16, India.

National Oceanographic Program, Fiscal Year 1965, ICO Pamphlet No. 15, 54 pp., printed, March 1964. Interagency Committee on Oceanography, Federal Council for Science and Technology, Office of Naval Research, Rm. 1818, 17th St. and Constitution Ave. NW., Washington, D. C. 20360. Outlines a coordinated plan for the accomplishment of national goals while pursuing individual agency missions. Part I, a summary of the Fiscal Year 1965 National Oceanographic Program, discusses oceanic research to meet National goals; 1965 plans and budgets; interpretation of the 1965 budget; program management; problems and emerging issues; and other related topics. Part II, a review of the Program and its cost, covers oceanographic effort--international oceanographic programs, and National services and facilities in oceanographic sciences; oceanographic resources--ships, instrumentation, and manpower and training; and the National budget for oceanography in detail.

Progress in Oceanography, vol. 1, edited by Mary Sears, 391 pp., illus., printed, 1963, \$15. Pergamon Press, 122 E. 55th St., New York 22, N. Y. Includes 5 papers: "Geological investigation of near-shore sand-transport," by E. Seibold; "Electrification of the atmosphere," by D. C. Blanchard; "Suspended organic matter in sea water," by T. R. Parsons; "The salinity problem," by R. A. Cox; and "Gulf stream '60," by F. C. Fuglister.

Recent Oceanographic Expeditions, USSR, OTS 64-21588, 59 pp., illus., printed, February 18, 1964, \$1.50. (Translated from the Russian, Okeanologiya, vol. 3, no. 3, 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.)

Role of Marine Fungi in the Biochemistry of the Oceans, II--Effect of Glucose, Inorganic Nitrogen, and Tris (Hydroxymethyl) Aminomethane on Growth and pH Changes in Synthetic Media, by Peter L. Sgurov and Jacqueline Simms, Contribution No. 491, 14 pp., illus., printed. (Reprinted from Mycologia, vol. LV, no. 6, November-December 1963, pp. 728-741.) Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### PERU:

"Contribution al Conocimiento de la Zona de Litorina en la Costa Peruana" (Contribution to the Knowledge of the Shallow-Water Zone of the Peruvian Coast), by M. Vegas V., article, Anales Cientificos, vol. 1, no. 2, July-August-September 1963, pp. 174-193, illus., printed in Spanish with English summary, single copy \$2. Universidad Agraria, Departamento de Publicaciones, Apartado 456, Lima, Peru.

#### PHYSIOLOGY:

Investigation into the Mode of Action of the Lateral Line System of Fish, by E. E. Sucklin and J. A. Sucklin, OTS 64-11018, 11 pp., processed, January 8, 1964, \$1.10. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

Studies in Gas Metabolism of Cold-Blooded Animals and Migrations and Radioactivity of Certain Marine Animals, USSR, OTS 64-21592, 56 pp., illus., printed, February 18, 1964, \$1.50. (Translated from the Russian, Zoologicheskiy Zhurnal, November 1963.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

#### PLANKTON:

Feeding of Zooplankton, with Special Reference to Some Experiments with SAGITTA, by M. R. Reeve, Contribution No. 510, 4 pp., printed. (Reprinted from Nature, vol. 201, no. 4915, January 11, 1964, pp. 211-213.) Marine Laboratory, Institute of Marine Science, University of Miami, 1 Rickenbacker Causeway, Miami 49, Fla.

#### PRESERVATIVES:

"Effect of Preservatives on Ripening and Keeping Qualities," by L. S. Levieva and S. I. Ivanova, article, Chemical Abstracts, vol. 59, July 22, 1963, 2097g, printed, American Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### PROCESSING:

"Recent Advances in Fish Processing Technology," by R. Spencer and R. B. Hughes, article, Food Manufac-

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

ture, vol. 38, August 1963, pp. 407-412, printed. Leonard Hill, Ltd., Stratford House, 9 Eden Street, London NW1, England.

#### RADIATION:

"Schistosomiasis: Age of Snails and Susceptibility to X-irradiation," by Alina Perlowagora Szumlewicz, article, *Science*, vol. 144, no. 3616, April 17, 1964, pp. 302-303, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D. C. 20005.

#### RESEARCH VESSEL:

A Report on the Conversion of U. S. Army T-Boat 427 to an Oceanographic Research Vessel, by James Gibbons, OTS 63-10043, 25 pp., processed, November 1963, \$2.60. Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20230.

#### ROUGH FISH:

Experimental Crappie Removal: Final Report, by James P. Carter, 18 pp., printed, 1963. Division of Fisheries, Department of Fish and Wildlife Resources, New State Office Bldg., Frankfort, Ky.

#### SALMON:

Atlantic Salmon Journal, no. 1, March 1964, 39 pp., illus., printed. Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Contains, among others, articles on: "Salmon Spawning Channel," by J. J. Quigley; "The Atlantic Salmon Commercial Fishery;" and "Moving Forward in Salmon Conservation," by H. J. Robichaud.

Cyclic Dominance in Adams River Sockeye Salmon, by F. J. Ward and P. A. Larkin, Progress Report No. 11, 120 pp., illus., processed, 1964. International Pacific Salmon Fisheries Commission, New Westminster, B. C., Canada.

"Scientists Probe Celebrated Salmon Enigma," article, *Trade News*, vol. 16, no. 9, March 1964, pp. 3-4, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Both Canadian and United States fisheries scientists are interested in finding out why all five species of Pacific salmon spawn only once and die shortly afterwards; while Atlantic salmon frequently survive, return to salt-water, and come back again to fresh-water spawning grounds. Halifax, Nova Scotia researchers are trying to provide an answer.

Survey of Chinook Salmon Spawning Grounds in the Upper Salmon River Drainage, 1962, by Ted Bjornn, Don Corley, and Jerry Mallet, 41 pp., illus., printed, 1963. Fisheries Division, Idaho Fish and Game, Commission, 518 Front St., Boise, Idaho.

"Trolling for Pacific Salmon," article, *Trade News*, vol. 16, no. 9, March 1964, pp. 7-9, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada. A pictorial story of the British Columbia salmon industry.

#### SHARKS:

Sharks of the Family Lamnidae, by G. Brooke Farquhar, Translation No. 157, 16 pp., printed, April 1963, 30 cents. U. S. Naval Oceanographic Office, Washington, D. C. 20280.

#### SHRIMP:

"Los Camarones Comerciales de la Familia Penaeidae de la Costa Atlantica de America del Sur: Clave para el Reconocimiento de las Especies y Datos Biogeográficos" (The Commercial Shrimp of the Family Penaeidae of the Atlantic Coast of South America: Key to the Recognition of the Species and Biogeographical Data), by Enrique E. Boschi, article, Boletín del Instituto de Biología Marina, no. 3, February 1963, pp. 1-39, illus., printed in Spanish. Instituto de Biología Marina, Universidades Nacionales de Buenos Aires, La Plata y del Sur, Mar del Plata, Argentina.

"Greatest Shrimping Grounds in Western Hemisphere," article, *The Fish Boat*, vol. 9, no. 3, March 1964, pp. 69-139, illus., printed, single copy 50 cents. H. L. Peace Publications, 624 Gravier St., New Orleans 12, La. A group of articles devoted to the new shrimping grounds off northern South America—Barbados, Paramaribo, St. Laurent, Cayenne, and Georgetown. Includes individual articles on: "U. S. 'Know-How' is Building Greatest Shrimp Fishery in the Western Hemisphere—75,000 Square Miles;" "Deep-Water Harbor, Modern Facilities Aid Newest Bid for Shrimp Business;" "Top Builder: Mr. Standardized Fleet;" and "British Guiana: Marketing 'Know-How,' Standardization Are Major Keys to Continuing Growth." Also presents articles about: "Dutch Guiana: Pioneer in New Fisheries Has Outstanding Plant and Facilities;" "Surinam and French Guiana Plants Boast Modern Freezing Equipment;" "French Guiana: New Plants and Fleets Being Readied in Expansion Program; Henderson Goes from Tangled Jungle to Elaborate Plant in Single Year;" "Will Fisheries Provide the Basis for Economic Revolution to the South?" by David B. Lord; "Trawlers with Many Novel Features Joins French Guiana Shrimp Fleet;" and others.

"Management of Marine Resources: Hydrography," by T. B. Ford, article, *Louisiana Conservationist*, vol. 16, nos. 5 and 6, May-June 1964, pp. 20-22, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life and Fisheries Bldg., 400 Royal St., New Orleans, La. 70130. With an understanding of various water conditions in the coastal areas, Louisiana researchers expect to be able to predict in advance production trends for the shrimp industry, determine causes of erratic changes in populations, and develop sound management practices for the commercially important shrimp species.

"Succulent Shrimp," by George Allen, article, *Alabama Conservation*, vol. XXXIV, no. 1, December 1963-January 1964, pp. 17-19, illus., printed. Alabama Department of Conservation, 64 N. Union St., Montgomery 4, Ala.

#### SMALL BUSINESS MANAGEMENT:

Accounting and Financial Data for Small Retailers, by Homer A. Brown and Alva A. Cummings, Management Research Summary, 2 pp., processed, 1964. Small Business Administration, Washington, D. C. 20416. An accounting system for small retailers should provide, among other things, a means of recording all transactions of the business; safeguarding the business from errors and fraud; and controlling operations. Good accounting records are the basis for many analyses that can be helpful in interpreting the results of past operations and in planning for the

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future. The value of the analyses, however, depends on proper application of their results.

**Export Marketing for Smaller Firms**, 101 pp., processed, May 1963, 50 cents. Small Business Administration, Washington, D. C. 20416. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.) With the owner or manager of a small firm lies the ultimate responsibility for the decision to commit his firm's resources toward the search for profits in foreign markets. The successful exploitation of overseas opportunities requires good business planning and judgment coupled with accurate and up-to-date facts about the overseas environment. This report covers these topics: "Measuring Your Export Potential;" "Selection of an Attractive Market for Detailed Analysis;" "Detailed Evaluation of Markets and Requirements for Successful Exporting," and "Channels of Distribution."

**Financial Facts which Lenders Require**, by Selwin E. Price, Management Aids for Small Manufacturers 164, 4 pp., processed, May 1964. Small Business Administration, Washington, D. C. 20416. This leaflet discusses the various kinds of financial facts which lenders require of prospective borrowers when considering a loan. The lending officer bases his judgment upon: (1) The type and nature of business collateral such as accounts receivable and inventory; (2) the company's audited financial statements; (3) the company's sales and cash projections; and (4) the company's operating and financial ratios. He also needs additional information so he can keep abreast of the company's progress during the life of the loan.

**Financing Problems of Small Manufacturers**, by Seymour Friedland, William A. Dymaza, and Thomas Moranian, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington, D. C. 20416. A summary of a report on financing problems of small producers. Findings of the report identify the basic problem of small-business financing as low net worth resulting from low profitability. The report suggests that more of the resources available for helping small business be applied to this problem. Areas recommended for consideration include counseling of small-business managers, redesigning of some control techniques for small-scale operations, and a mutual fund to facilitate stock financing by small firms.

**Keeping Machines and Operators Productive**, by Howard Pyle, Management Aid for Small Manufacturers 162, 4 pp., processed, April 1964. Small Business Administration, Washington, D. C. 20416. Plant safety pointers for owner-operators are offered in this leaflet. Points out that false attitudes of supervisors and employers can hamper the owner-manager's accident prevention efforts. Describes the kinds of moving parts of machinery which should be guarded and suggests kinds of guards that can be used to prevent injuries. Sources of help which the owner-manager may find useful in setting up a machine guarding program are also listed.

#### SMOKING:

"Pretreatment for Smoking Oily Fish," by Minoru Fujii and others, article, *Chemical Abstracts*, vol. 58, May 27, 1963, 11899b, printed. American

Chemical Society, 1155 16th St. NW., Washington 6, D. C.

#### SPAIN:

"Asturias y el Mar en la Estadistica de 1963" (Asturias and the Sea in the 1963 Statistics), by Daniel Arbesu, article, *Puntal*, vol. XI, no. 119, February 1964, pp. 23-24, printed in Spanish. *Puntal*, Apartado de Correos 316, Alicante, Spain.

"Espana, Primer Pais Pesquero de Europa" (Spain, First Fishery Country of Europe), by Fandino, article, *Puntal*, vol. XI, no. 119, February 1964, pp. 2-3, illus., printed in Spanish. *Puntal*, Apartado de Correos 316, Alicante, Spain.

"La Industria Espanola de Conservas de Pescado" (The Spanish Fish Canning Industry), by Antonio Altageme del Busta, article, *Informacion Conservera*, vol. XI, no. 111-112, March-April 1964, pp. 67-70, printed in Spanish, single copy 60 Ptas. (US\$1). *Informacion Conservera*, Colon, 62, Valencia, Spain.

#### SPINY LOBSTER:

"Spiny Lobster Industry in Southern Africa (An Economic Survey)," by D. J. Soares-Rebelo, article, *South African Journal of Science*, vol. 60, no. 3, March 1964, pp. 81-87, printed, single copy 50 cents (about 70 U. S. cents). The South African Association for the Advancement of Science, P. O. Box 6894, Johannesburg, South Africa Republic. Detailed information is given on the thriving spiny lobster industry of the Republic of South Africa and of the mandated territory of South-West Africa. Spiny lobster fishing, production, exports, consumption, canning and processing, regulation, conservation measures, and economic significance in both those countries are discussed at length.

#### STANDARDS:

**Standards and Requirements for Fish Handling, Processing, Distribution, and Quality**, by D. D. Tapiador and J. E. Carroz, Fisheries Report No. 9, 255 pp., processed, 1963. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. The 11th FAO Conference endorsed under the regular program of the Fish Processing Section, Technology Branch, the preparation of a document on laws and regulations concerning fish handling, processing, distribution, and quality control. In addition, it is the aim of FAO, in launching the Freedom from Hunger Campaign, to encourage increased fish production; promote its greater availability; and widen distribution by building up trade in fishery products and ensuring improvements in their quality. This report is essentially a study and digest of governmental codes, laws, and regulations.

#### ST. PIERRE AND MIQUELON:

"St. Pierre et Miquelon Peut Produire du Poisson Surgele au Prix Internationale" (St. Pierre and Miquelon are Able to Produce Frozen Fish at the International Price), by H. Clarieux, article, *France Peche*, no. 81, February 1964, pp. 19, 21-22, illus., printed in French. *France Peche*, Boite Postale 179, Lorient, France.

#### TRAWLERS:

"Some Fundamentals for the Calculation of the Motion of a Trawler with Trawl Gear," by H. Stengel,

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article, *Fischereiforschung*, vol. 5, no. 3, 1962, pp. 10-14, printed in German, Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, E. Germany.

#### TUNA:

"La Determinazione dell'Istamina nei Tonni del Golfo di Guinea" (The Determination of the Histamine in the Tuna of the Gulf of Guinea), by H. Plagnol and J. F. Aldrin, article, *Industria Conserve*, vol. XXXVIII, no. 4, October-December 1963, pp. 321-327, illus., printed in Italian, single copy L. 1,500 (about US\$2.40). *Industria Conserve*, Viale Tanara 33, Parma, Italy.

#### TURKEY:

Balki ve Balikcilik (Fish and Fishery), vol. XII, no. 3, March 1964, 35 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G.M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Sponge, (Part II);" "The Postmortem Changes in Turkish Sea-Water Fishes (Part II);" and "Importance of Fisheries Production in the Food Economy of the World."

Balki ve Balikcilik (Fish and Fishery), vol. XII, no. 4, April 1964, 33 pp., illus., printed in Turkish with English table of contents and abstracts. Et ve Balik Kurumu G.M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes articles on: "The Sponge, (Part III);" "Fish Pump;" "Basic Researches on the Development of Fishery in Turkish Fresh Waters, Lakes, and Dams, Part III;" "Used Materials in Netting and New Products;" "Israel's Sea Fisheries;" and "The New Activities of Processing for the Aim of More Stability and Situation of High Fish Meal Production in the World."

#### U.S.S.R.:

Rybnoe Khozaiastvo, vol. 40, no. 3, March 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U.S. cents). Rybnoe Khozaiastvo, B-140, V. Krasnosel'skia 17, Moscow, U.S.S.R. Includes, among others, article on: "The Abundance of Herring in the Caspian Sea," by N. I. Kozhin; "Optimal Dosage and Rational Use of Sperm during Insemination of Salmon Eggs," by V. Z. Trusov and L. M. Pashkin; "Arsenic as an Indicator of Sanitary and Hydrobiological Conditions of Reservoirs in the Ukrainian Steppe," by C. P. Fedii; "Improvement Made on the Production and Transport Refrigerator Kaliningrad," by A. G. Ionov; "Production of Processed Herring on the Floating Base Iohannes Vares," by L. G. Visk; "Vibration Conveyers and the Transportation of Fish," by L. M. Stolin and A. Z. Umantsev; "Mechanization of the Moving Cages in Smoking Houses," by G. E. Akhalkov and E. A. Shmul'ian; "New Types of Canned Fish Products: Fish and Vegetables Canned with Georgian-Type Sauces," by L. E. Tsuladze; "The Determination of the Level of Mechanization of the Basic Production in Fishery Plants," by I. Mogilevskii and M. Shuvailova; and "The Profile of a Mechanical Engineer Specialized in the Fishing Industry," by Iu. B. Iudovich.

-Milan A. Kravanya

Sakhalin Fishermen Initiate Socialist Competition to Increase Fish Catches USSR, OTS 64-21597, 6 pp.,

illus., printed, February 19, 1964, 50 cents. (Translated from the Russian, *Pravda*, January 25, 1964.) Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20235.

"Sovjets Fiske i Stark Utveckling; Systematisk Forsknings Visar Vagen" (Strong Development in Soviet Fisheries; Systematic Research Finds its Way), article, *Svenska Västkust Fiskaren*, vol. 34, no. 5, March 1964, pp. 96-97, illus., printed in Swedish. Svenska Västkustfiskarnas, Ekonomiutskottet Postbox 1014, Göteborg 4, Sweden.

The following processed reports are for sale by the Office of Technical Services, U.S. Department of Commerce, Washington, D.C. 20230, at 50 cents a copy.

Age of the Ob Whitefish (*COREGONUS MUKSUN*) and Some Problems in Theory, by V. V. Barsukov, OTS 63-11110, 7 pp., 1963. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 39, no. 10, 1960, pp. 1525-1530.)

Feeding and Food Relationships of Predatory Fishes in the Northern Part of the Rybinsk Reservoir, by E. S. Zadul'skaya, OTS 63-11127, 57 pp., 1963. (Translated from the Russian, *Trudy Darvinskogo Gosudarstvennogo Zapovednika*, no. 6, 1960, pp. 345-405.)

Effect of Temperature on the Embryonic Development of the Pike, the Blue Bream (*ABRAMIS BALLERUS* L.) and the White Bream (*BLICCA BJOERKNA* L.), by V. M. Volodin, OTS 63-11124, 7 pp., illus., 1963. (Translated from the Russian, *Trudy Instituta Biologii Vodokhranilishch*, vol. 3, no. 6, 1960, pp. 231-237.)

Sanitation Bacteriological Control Analyses in the Fish Preserving Industry, by Yu. A. Ravich-Shcherbo, OTS 63-11119, 4 pp., 1963. (Translated from the Russian, *Voprosy Pitaniya (Morskva)*, vol. 19, no. 5, 1960, pp. 79-82.)

Symposium on Problems Related to the Population Dynamics of Commercial Animals, by G. B. Nikol'skii, OTS 63-11117, 4 pp., 1963. (Translated from the Russian, *Zoologicheskii Zhurnal*, vol. 36, no. 11, 1960, pp. 1747-1750.)

#### VIRGINIA:

64th and 65th Annual Reports of the Commission of Fisheries of Virginia (for the Fiscal Years Ending June 30, 1962 and June 30, 1963), 32 pp., illus., printed. Commission of Fisheries, Newport News, Va. Discusses enforcement and personnel, work of the engineering Department, Potomac River activities, fishery statistical collection, and oyster research. Also covers accomplishments by the commission in conservation and rehabilitation, pollution control, fishery legislation, and other areas. Statistical tables present data showing receipts from the fish and oyster industry, by districts; recorded oyster planting grounds; and other related information.

#### VITAMIN A:

"Vitamin A Enriched Fish Sausage. I--A Determination of Vitamin A Enrichment in Fish Sausage, and Loss of Vitamin A during Manufacturing and Storage," by Masao Hasegawa and Tomiyo Nishimura, article,

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**Chemical Abstracts**, vol. 58, May 27, 1963, 1189d, printed. American Chemical Society, 1155 16th St., NW., Washington 6, D. C.

**WHALING:** *International Whaling Statistics*, no. LII, 48 pp., printed, 1964. Det Norske Hvalrads Statistiske Publikasjoner, Oslo, Norway. Results of the whaling operations in the Antarctic during the season 1962/63. Includes statistical tables on whaling operations of Japan, the Netherlands, Norway, United Kingdom, and the U.S.S.R.; average size of whales caught; and number of whales caught, by species, sex, and size. Also includes data on average production of oil per blue-whale unit.

"Whale Marking Cruises in New Zealand Waters Made between August and December 1963," by D. E. Gas-kin, article, *Norsk Hvalfangst-Tidende* (The Norwegian Whaling Gazette), vol. 53, no. 2, February 1964, pp. 29-41, illus., printed. Hvalfangerforeningen, Sandefjord, Norway.

**Whaling: Amendments to the Schedule to the International Whaling Convention Signed at Washington on December 2, 1946 (Adopted at the Fifteenth Meeting of the International Whaling Commission, London, July 5, 1963), Treaties and Other International Acts Series 5472, 3 pp., printed, 1964, 5 cents. Department of State, Washington D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)**

#### CORRECTION

In the February 1964 issue, page 99, article, "A Study of Redfish, *Sciaenops ocellatus* (Linnaeus) and Black Drum, *Pogonias cromis* (Linnaeus)," the address of the publisher of the Publications of the Institute of Marine Science, was given in error. The correct address is Institute of Marine Science, University of Texas, Port Aransas, Texas.



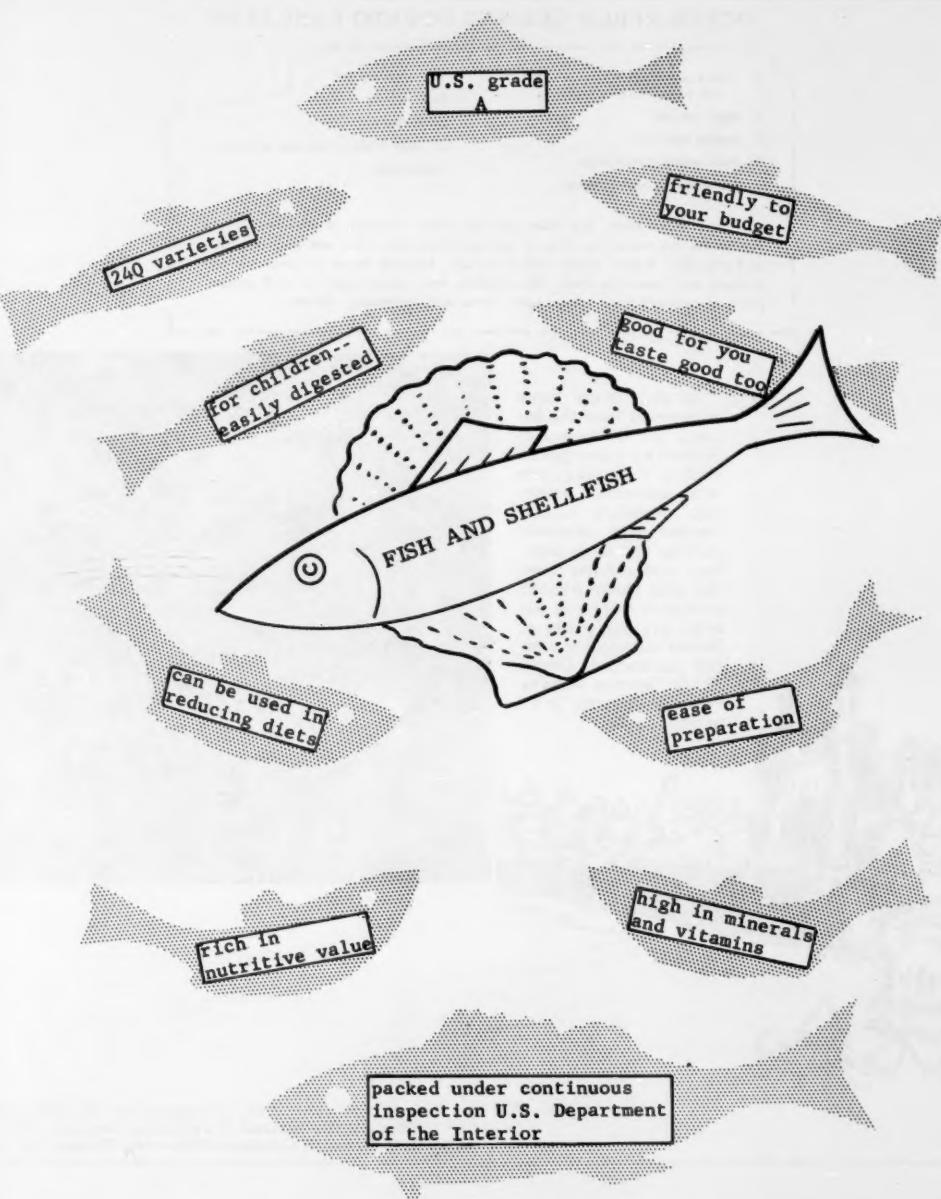
#### FISHERIES IMPORTANT TO UNITED STATES

The fisheries of America have played a unique part in this country's economy since its founding. John Cabot, returning to England in 1498 from North America, stated that "the sea there is swarming with fish which can be taken not only with the net, but in baskets let down with a stone." Historians record that the founders of the Plymouth Colony came to America to serve God and to catch fish.

The colorful New Bedford and Nantucket whaling fleets ranging the oceans of the world in the 19th century were a large factor in forming the bonds which eventually joined Hawaii to the United States. The great salmon fisheries have been a principal support of Alaska through the years and have been a greater source of wealth than all the gold produced there since the Alaska gold rushes began. During World War II, the spectacular tuna clipper fleet furnished the ships and the men which maintained contact with our beleaguered troops during their initial days of perilously slight foothold on the Solomon Islands, and these same fishing boats helped supply small island garrisons throughout the vast reaches of the Pacific during the entire war. U. S. trawlers and purse seiners also went to war as minesweepers and patrol vessels.

--Excerpt from Trident--A Long Range Report of the Bureau of Commercial Fisheries, Circular 149.

## THE PLACE OF FISH



### OCEAN PERCH GERMAN POTATO PANCAKES

1 pound ocean perch fillets or other fish fillets, fresh or frozen  
 3 eggs, beaten  
 2 tablespoons flour  
 2 tablespoons grated onion  
 1 tablespoon chopped parsley

2 teaspoons salt  
 Dash nutmeg  
 Dash pepper  
 2 cups finely grated raw potatoes  
 Applesauce

Thaw frozen fillets. Skin fillets and chop finely. Combine all ingredients except Applesauce; mix thoroughly. Drop  $\frac{1}{2}$  cup fish mixture onto a hot, well-greased griddle or frying pan. Flatten slightly with a spatula. Fry until brown on one side; turn carefully and brown the other side. Cooking time approximately 6 to 8 minutes. Drain on absorbent paper. Keep warm. Serve with Applesauce. Serves 6.

In this recipe home economists from the Bureau of Commercial Fisheries have given chafing-dish elegance with iron-skillet economy. Tastefully supplemented with aromatic nutmeg and lively parsley, meaty fillets from the cold North Atlantic provide a wealth of energy-giving protein. Served sizzling hot with tart applesauce, Ocean Perch German Potato Pancakes will rate "ja's" at your table.



--From Fisheries Marketing Bulletin: "Protein Treasure from the Seven Seas."  
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# Let's Get **HOT** with **COOL** **TUNA**



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#### IMPORTANT NOTICE

Due to an unexpected mix-up in the mailing of the June 1964 issue of the magazine, there are probably a number of subscribers who did not receive that issue. If you are one of those who did not receive that issue, write us for a copy.

